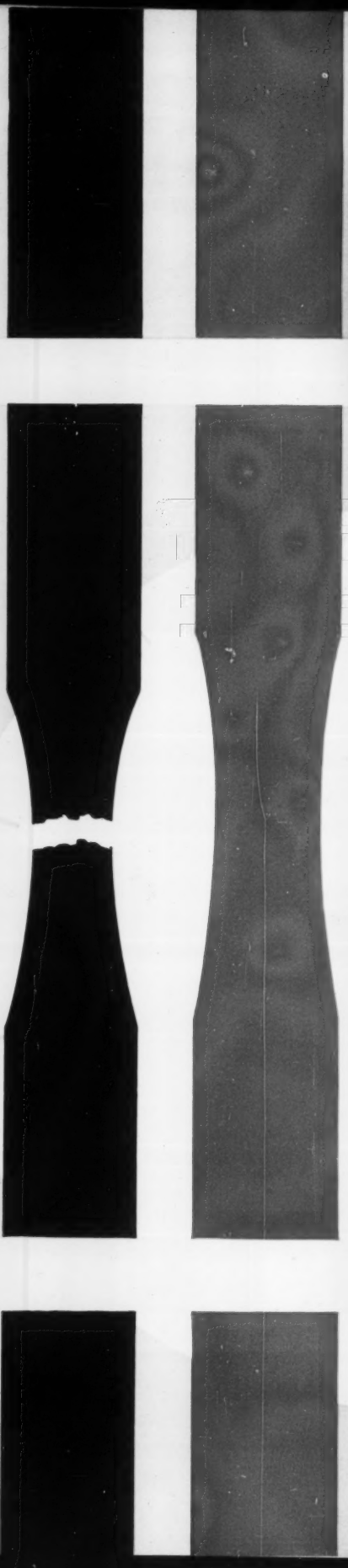
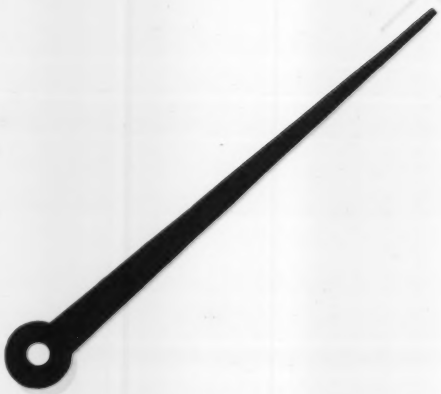
DECEMBER 23, 1957

STEEL
The Metalworking Weekly

A PENTON PUBLICATION





Greater Cold Working Upgrades Carbon Steel

—Page 66

- Plenty of Nickel—at Last . . . Page 35
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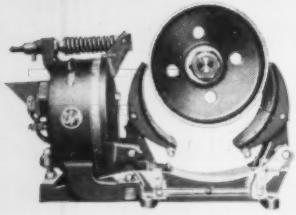
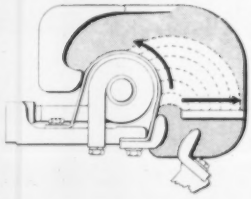
It's EC&M for a Complete Line of ELECTRIC CRANE CONTROL

BRAKES · DISCONNECT SWITCHES · CONTROLLERS · LIMIT STOPS

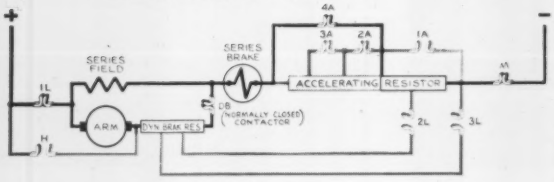


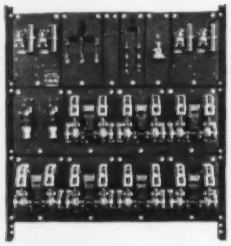
LONG-LIFE BRAKES for cranes operated by A.C. or D.C. power. High speed performance. Low upkeep.



CONTACTORS operate on the LINE-ARC principle. No destructive burning of arc shields. Cool contacts and reduced maintenance.

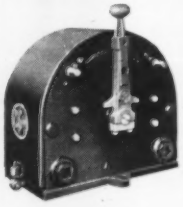
DYNAMIC LOWERING CIRCUITS for hoist motions. Respond quickly. Permit accurate inching for spotting loads.



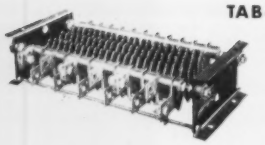


REVERSING-PLUGGING CONTROL for bridge and trolley motions. Automatically controlled acceleration. Only one simple relay for plugging.

YOUNGSTOWN SAFETY LIMIT STOPS protect against overhoisting accidents. Positive check against human errors.



CAM-TYPE MASTER SWITCHES have narrow width and short throw. Less operator fatigue.



TAB-WELD PLATE RESISTORS —spot-welding provides a continuous path, and keeps resistance value constant.

MANUAL-MAGNETIC DISCONNECT SWITCHES are very easy to operate. They are arranged to control crane lights, too.

THE ELECTRIC CONTROLLER & MFG. CO.

A DIVISION OF THE SQUARE D COMPANY

CLEVELAND 28 • OHIO

7405

He's Ready to Hammer Out Anything You Give Him

When this photograph was taken in the Bethlehem drop-forge shops, the operator was pounding out an order of steam-trap bodies. Right after he finished, there was another job waiting for him to handle. It bore no relation to steam-trap bodies, nor did the forgings he made in the several weeks that followed. No two jobs were alike.

A Bethlehem forge-shop man is prepared for all designs. He's ready for anything. Once in action, he makes those hammers and presses dance, and they dance to his tune. He's a man who knows his craft.

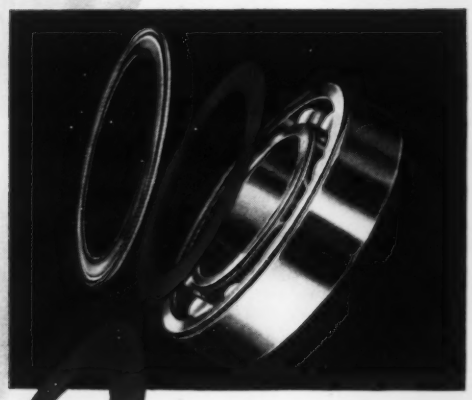
That's one of the reasons why Bethlehem closed-die forgings are unexcelled anywhere. Other vital factors are quality steel, an alert metallurgical service, and first-class treating and inspection facilities. All of these Bethlehem has. Whenever you need closed-die forgings ranging from one to 250 lb, we suggest you call us. We'll cooperate fully.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL



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The most silent rolling contact bearing in the world of today

EVERY TYPE—EVERY USE

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- *Spherical Roller Bearings*
- *Tapered Roller Bearings* (Tyson®)

®Reg. U.S. Pat. Off.

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.

7761

Studs for NELWELD process machined from Youngstown cold finished bars

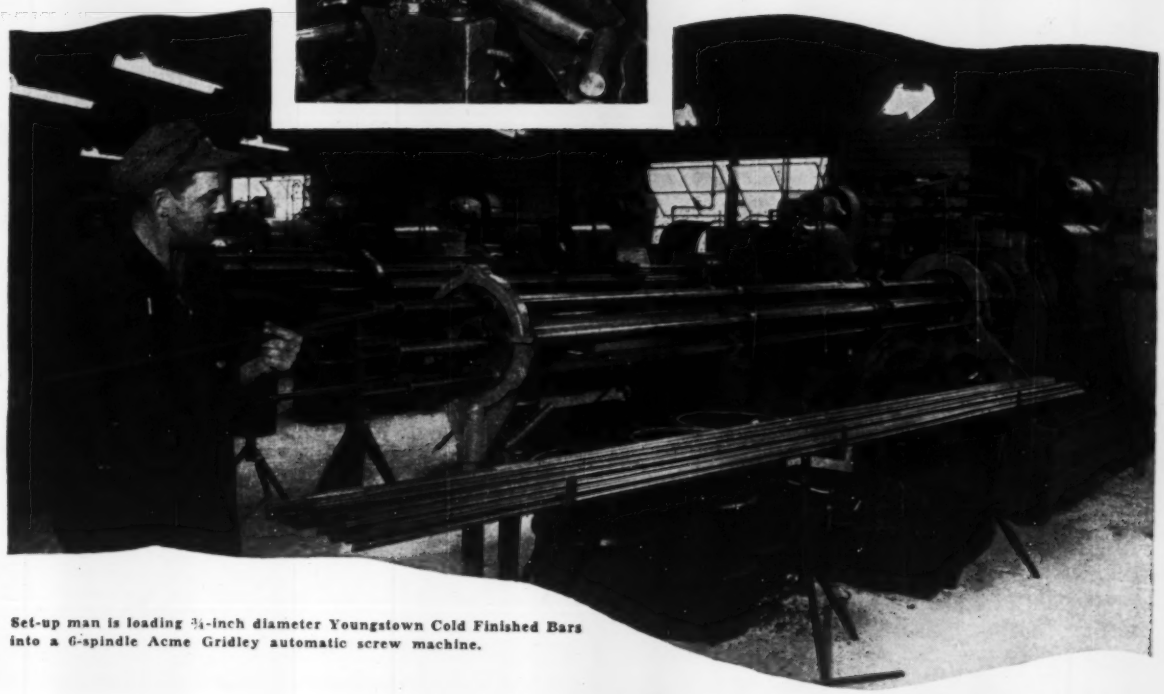
Progressive fabricators rely on the Nelweld method for fast, dependable end-welding of studs to steel surfaces. This novel electric arc process—utilizing flux-filled steel studs—substantially reduces direct fastening costs when used to replace conventional time-consuming methods such as drilling, tapping, hard welding, through-bolting or the securing of straps and rivets.

To maintain their world-wide reputation for product quality and uniformity, Nelson Stud Welding, a division of Gregory Industries, Inc., uses Youngstown Cold Finished Bars as the basic material for stud production.

Youngstown Cold Finished Bars provide high machinability and greater uniformity of composition, structure and surface finish to help you increase production of more uniform parts. Always specify Youngstown—it's your best assurance of quality.

Why not call or write your nearest Youngstown District Sales Office today for additional information or metallurgical assistance?

Close-up of studs being bored to accomodate their charge of flux (top collet) and then cut-off (center collet). Two finished Nelweld studs, shown in the pan in foreground, were machined simultaneously in the 6-position machine. First operation—feed out and face; second—bore; and third—cut-off.



Set-up man is loading ¾-inch diameter Youngstown Cold Finished Bars into a 6-spindle Acme Gridley automatic screw machine.

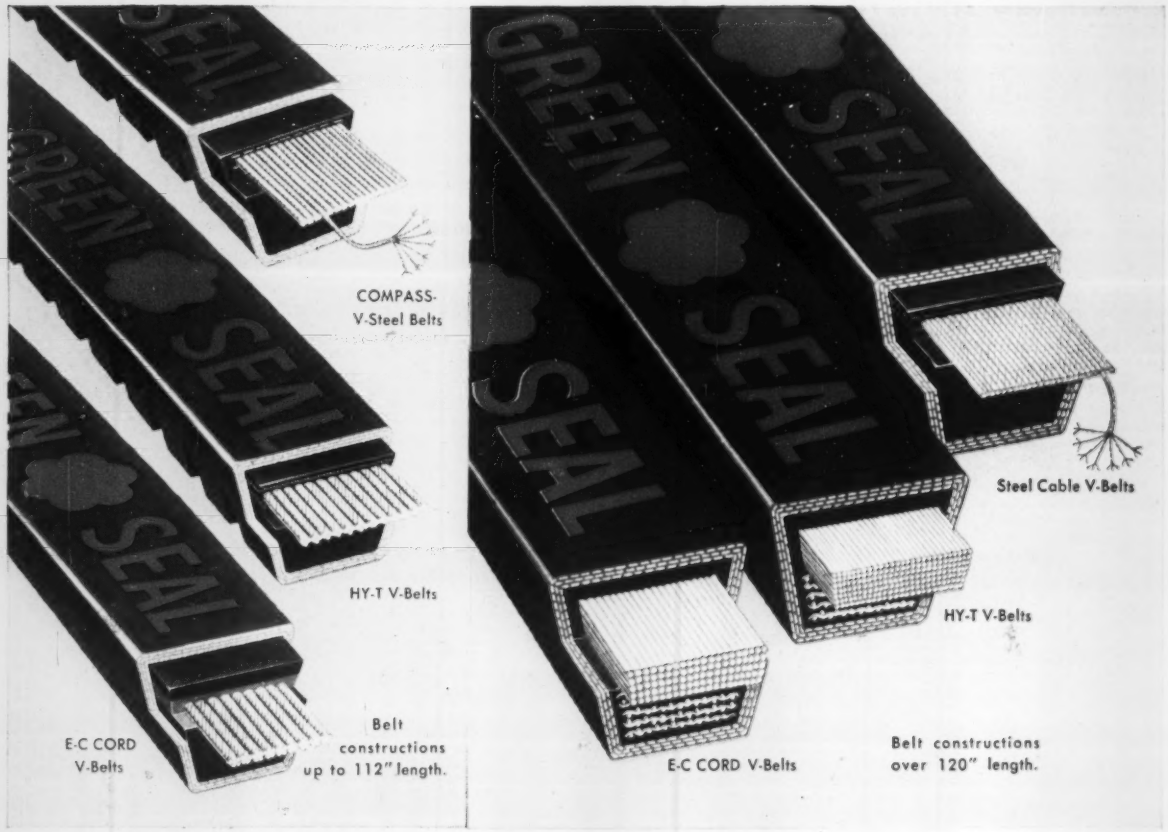
THE YOUNGSTOWN SHEET AND TUBE COMPANY
Manufacturers of Carbon, Alloy and Yoloy Steel
General Offices - Youngstown 1, Ohio
District Sales Offices in Principal Cities

QUALITY YOUNGSTOWN SERVICE

Cold finished bars

Do you know the inside story of

V-Belts with the Green Seal?



Until recently dimensional stability was possible only in V-Belts with steel load-carriers as developed by Goodyear. But now you can have that stability in a complete line of belts – thanks to the development of Triple-Tempered (3-T) cord–synthetic cord tempered by Tension, Temperature and Time.

What's your pay-off from this dimensional stability?

When you're belting multiple drives, it's your one guarantee that every set of matched belts will *really* match. No matter how long you store them, they'll *stay* matched, too.

And once they're installed, you've got belts designed and built to work as a perfect team–without individual belts either "loafing" or overworking. In fact, you're protected from all the usual mismatching headaches that also include slipping, stretching, scorching.

In other words, you're belted for maximum trouble-free horsepower hours at minimum cost. There's no substitute for that kind of performance – or for the V-Belts with the Green Seal that give it to you – every time.

So see your dealer about the V-Belts with true dimensional stability–the V-Belts with the Green Seal. Or write Goodyear, Industrial Products Division, Lincoln 2, Nebraska, or Akron 16, Ohio.

DIMENSIONALLY STABLE V-BELTS
with the GREEN SEAL by

GOODYEAR

THE GREATEST NAME IN RUBBER

Compass, E-C Cord, Hy-T, Green Seal–T.M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

Watch "Goodyear Theater" on TV – every other Monday 9:30 P.M., E.S.T.

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The Metalworking Weekly

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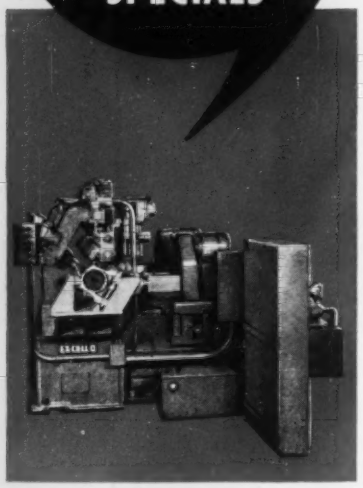
STEP-BY-STEP AUTOMATION WITH EX-CELL-O SPECIALS



Your first step into automation may cost much less than you think. In medium-sized shops, for example, a profitable, automated set-up may involve the purchase of a relatively simple transfer machine, such as the one illustrated above, consisting of two standard way-type units. Or, even more simply, a single standard machine which easily fits into automated set-ups later on.

In any case, a host of Ex-Cell-O engineers, laboratory technicians and production specialists are at your service. *No obligation whatsoever.* Call your Ex-Cell-O Representative or write Ex-Cell-O, Detroit.

SEND FOR FREE BROCHURE

This 20-page catalog will show you the most profitable way to put automation into your present operations—make your own "Automation Appraisal." Ask for Bulletin 50155.

XLO EX-CELL-O FOR PRECISION

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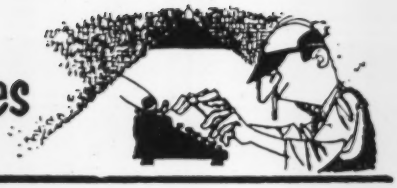
EX-CELL-O CORPORATION
DETROIT 32, MICHIGAN

behind the scenes



Merry Christmas to All

Today is Dec. 23, 1957. Since it is but two days short of Christmas, everybody on STEEL takes this opportunity to wish all of you a merry Christmas. An added thought was contributed by a little man who hibernates in the park across the street. He sent it by pigeon post:

Now, it's true this festive season
Is an advertising reason
For the folks who offer products
That just drip with sales appeal;
But this constant pressure selling
And the barking and the yelling
From October clear to Christmas,
Well—let's say it's not genteel!

Maybe Christmas would be gayer
If the merchants and purveyors,
The hawkers and the dealers,
And the folks who make a deal
Were to peradventure slacken
All their advertising clackin',
And grant a little respite
E'er the bells begin to peal.

Cold Steel

The celebrated crack, "What's good for General Motors is good for the country, and vice versa," isn't really as terrible as it sounds. In fact, if interpreted correctly, it makes some sense. The same is true of a variation of the phrase: "What's good for the Army is good for industry." In this case, we are speaking of the Ordnance Department, and L. J. Ebert, associated with Case Institute of Technology. Dr. Ebert has been working on an extensive project for the Ordnance Department—something about beefing up the properties of cold-worked steels. Considering that Ordnance's main aim is to blow people to bits, and Case's main aim is to produce engineers, you wouldn't think the association would be of any benefit to industry. But it is; turn at once to Page 66 and learn how engineering and economic gains can be made by getting more out of cold-worked steels.

The Stolen Ingot

Allan L. Percy, director of publicity for Fansteel Metallurgical Corp., North Chicago, Ill., a few weeks ago was called upon to publicize a company calamity, to wit, the theft of a 28-lb ingot of columbium (sometimes called niobium) from the company's exhibit at the New York Chemical Industries Exhibition. The ingot, made of vacuum cast metal, is 3 in. in diameter, 14 in. long, and is valued at $5000. It cannot be melted except by the special techniques with which its was made. However, it can be cut up, and if it is, Fansteel will have a broken heart because it is believed to be the largest chunk of columbium ever produced. The loss is covered by insurance, but the company doesn't want the money: it wants the metal.

When Editor Walt Campbell heard about it, he clucked his sympathy, but couldn't help remarking that it was too bad the ingot wasn't radioactive. "We could modernize Sherlock Holmes," he grinned, "and science could triumph over pure deduction."

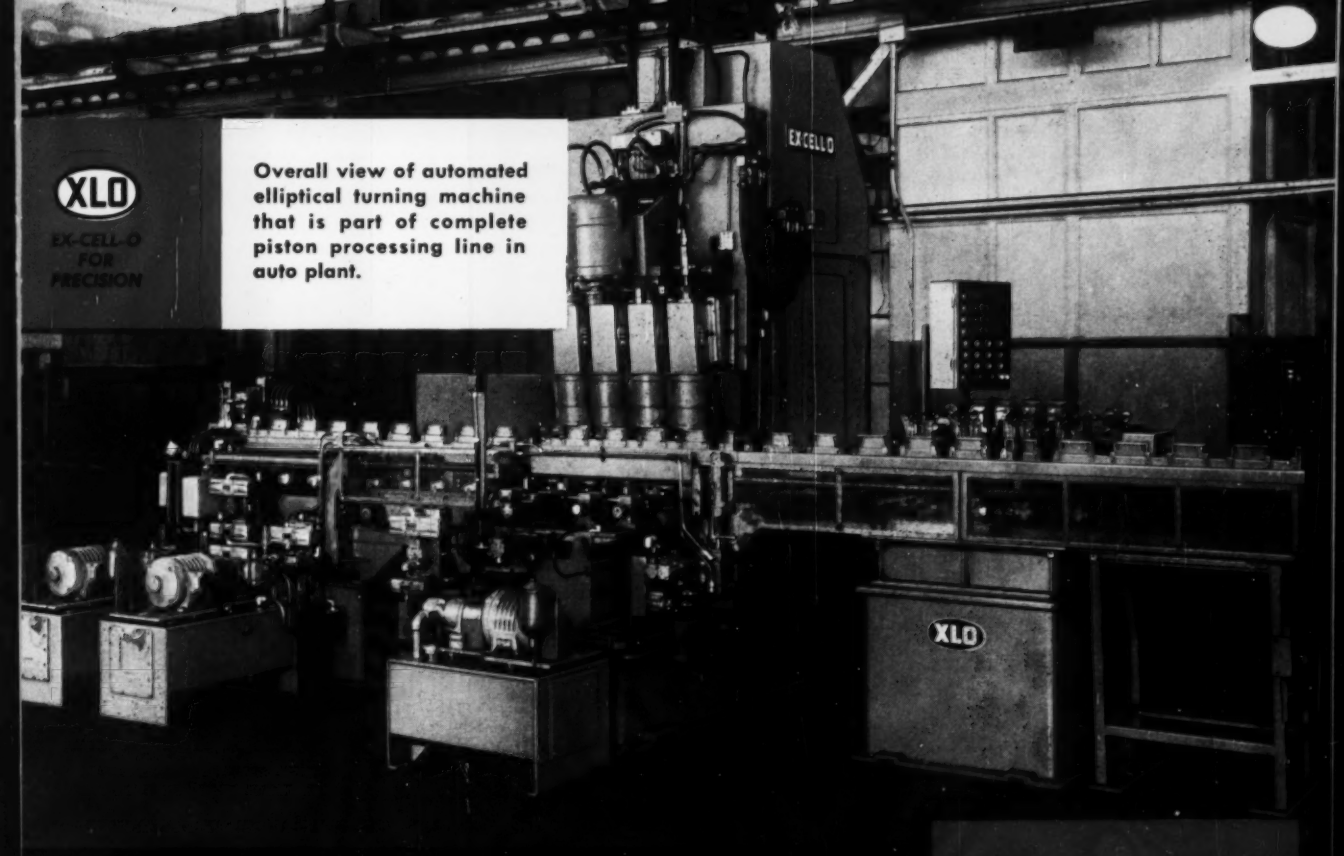
Hic!

Harry W. Smith Inc., technical publicists, New York, threw a dignified wing ding on Dec. 13 at the New York Princeton Club. Invitations received by STEEL editors suggested that "the pleasures of companionship and conversation with your confreres in the editorial fraternity will be subtly enhanced with selected comestibles and potables for palates of every persuasion." The program set the pattern, listing first among the papers "Meteorological Influences on Random Satellite Sightings in the Hebrides: An Appreciation of Scotch Mist. Presented by Titus A. Drum, Cloud Chamber Supervisor, Bog, Marsh & Fen Inc."

We haven't heard anything more from that Society of Punch Bowl Engineers, but if any extraordinary publicity comes from the Harry W. Smith boys before complete recovery is established, we are going to view it plumb quizzically.

Shrdlu

(Metalworking Outlook—Page 29)



Overall view of automated elliptical turning machine that is part of complete piston processing line in auto plant.

Roughs and Finishes 250 Pistons per Hour

57-77

This automated Ex-Cell-O machine semifinish and finish turns an elliptical shape on automotive piston skirts at the net rate of 250 pieces per hour.

Pistons enter the machine from a conveyor, are radially located from their wrist pin holes and clamped on the ring land diameters. Four heads machine four piston skirts simultaneously. Air gaging follows the machining operation, after which pistons are ejected to another conveyor.

Write to Ex-Cell-O or contact your local representative for further information or a proposal.

EX-CELL-O CORPORATION *Machinery Division*
DETROIT 32, MICHIGAN

MANUFACTURERS OF PRECISION MACHINE TOOLS • GRINDING AND BORING SPINDLES • CUTTING TOOLS • TORQUE ACTUATORS • RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

"With Weirkote® you can forget plating or dipping after fabrication. It just won't peel or flake!"

Q.—Weirkote—is that a new kind of steel?

A.—*"New" only to those who don't know of its advantages. It's a zinc-coated steel with a skin-tight surface, produced by a continuous galvanizing process instead of the old pot-dip method.*

Q.—Well, we've tried galvanized before for the parts and products we make. But it just couldn't stand up under the punishment of fabrication.

A.—*Must have been the old type galvanized. When you use Weirkote for fabrication, you'll find its surface stands up under the severest stresses. Punch it, lock it, crimp it, deep-draw it—its zinc coating stays intact. It's got a* built-in *resistance to peeling and flaking.*

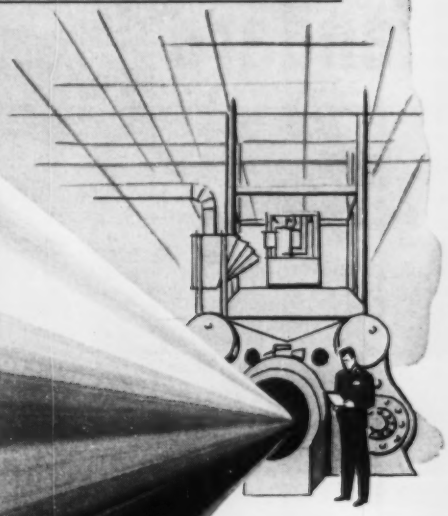
Q.—Well, say—that'd save all the cost of plating or dipping after fabrication, wouldn't it?

A.—*Exactly! Plus assuring you a* uniform *protective coating at all times—something even a special coating doesn't always provide on the more intricately fabricated parts.*

Send today for free booklet that details the time- and cost-saving advantages of using skin-tight zinc-coated Weirkote. Write Weirton Steel Company, Dept. B-1, Weirton, West Virginia.

WEIRTON STEEL COMPANY
WEIRTON, WEST VIRGINIA
a division of
NATIONAL STEEL CORPORATION

FOR YEARS OF PIPE ECONOMY...



THIS EXTRUDED HEAVY WALL

PROTECTS

against severest heat, pressure and corrosion

Here is High Integrity pipe for the toughest applications in the power, petroleum, chemical and other industries. Extruded from any ferrous alloy in lengths up to 50 feet or more, and with virtually any wall thickness, this pipe from the Curtiss-Wright Metals Processing Division provides increased on-the-job life, long-term economy, elimination of down time – not just for months, but for years to come. Extruded to specification under tremendous one-push pressures from the Division's giant 12,000-ton horizontal steel extrusion press, Curtiss-Wright Heavy Wall Pipe is of uniform high strength and has high resistance to pressure, heat and corrosion. Write today for information on both your standard and special requirements.

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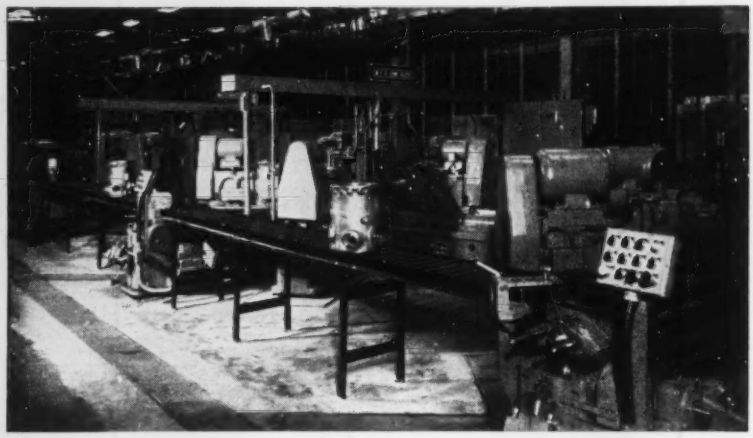
METALS PROCESSING DIVISION
CURTISS-WRIGHT
CORPORATION • BUFFALO, N. Y.

OFFICES IN: NEW YORK • CHICAGO • LOS ANGELES • DAYTON • MONTREAL

Ask Standard

how to cut costs with conveyors



Standard gravity roller conveyors like this are modest in cost, easy to install and maintain.

Conveyor system helps Airtemp up compressor parts production 40%

To handle stepped-up demands for residential and industrial air conditioners, the Airtemp Division of the Chrysler Corporation undertook an extensive re-tooling program. On one compressor crankcase line, for example, they installed 17 new machine tools . . . connected them all with Standard gravity roller conveyors. Result — two hours saving per case, production up 40%.

If you're planning on modernizing or retooling it will pay you, too, to find out how Standard conveyors can complement new equipment . . . give you lower overall costs and greater productive efficiency. STANDARD CONVEYOR COMPANY, North St. Paul 9, Minnesota. Sales and Service in Principal cities.

To expedite shipping or stocking and reduce handling costs, investigate Standard lightweight portable roller conveyors (right) or the portable, self-powered HANDIBELT conveyor (left), which can be used horizontally or at varying incline or decline angles.

For details — contact the Standard representative listed in the classified phone book or write direct. Ask for Bulletin 309, address Dept. Y-12.

Standard 50 years of conveyor experience

GRAVITY & POWER CONVEYORS

LETTERS TO THE EDITORS

Impressed with Editorials

I would appreciate a copy of the article, "Unbridled Electronics" (Nov. 25, Page 60).

I congratulate you on your effective material. I'm particularly impressed with your editorials. Both of your editorial writers do an outstanding job.

Earl R. Lind
Manager
Office Standards & Methods Div.
Joseph T. Ryerson & Son Inc.
Chicago

Informative and Stimulating

Please send three copies of the articles, "Management's First Line" (Oct. 14, Page 76) and "How To Be a Better Boss" (Sept. 23, Page 90).

Thanks for the articles. Keep them coming. They're informative and stimulating.

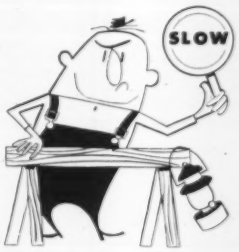
J. Rupert
Training Supervisor
Clearing Machine Corp.
Chicago

Copies for Reference

Please send two copies of your article, "Pickling Stainless To Remove Scale" (Nov. 25, Page 103). We would like to give one to our plating foreman and file one in the office for our reference copy.

Ken Shipman
Ralph Shipman Co.
Sunbury, Pa.

Caution in '58 Labor Demands?



I would like a copy of the article, "'58 Worries Labor Unions" (Dec. 2, Page 53). It has a lot of valuable information I would like to keep.

Adrian H. Siereveld
Director of Employee Relations
Hamilton Foundry & Machine Co.
Hamilton, Ohio

Finds Excellent Article

Looking over the Nov. 18 issue, I found an excellent article, "Prepared Annealing Atmospheres" (Page 160). I would appreciate several copies.

R. K. Matuschkovitz
Research & Development Dept.
National Cylinder Gas Co.
Chicago

Article Merits Attention

Your Trends-in-Metals article, "Stainless Steels" (Nov. 4, Page 107), merits the highest attention. It gives remarkable facts for the analysis of the market situation. We consider it an im-

(Please turn to Page 12)

STAINLESS STEEL MAKES THE DIFFERENCE

...its effect on car sales and resales

Nothing sells and satisfies like quality. Stainless steel provides proof of quality in a way the buying public can *easily* understand.

Consumers know from experience that stainless steel means rust resistance . . . strength . . . freedom from scratches and dents. They *know* it stays bright without polishing.

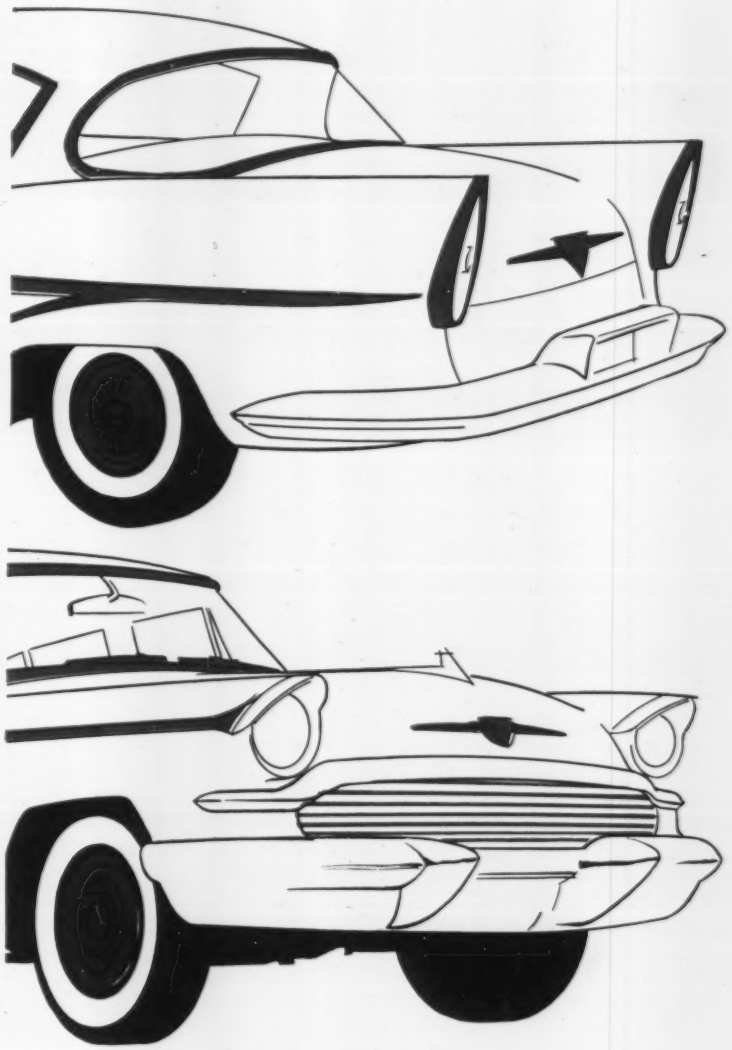
That's why stainless steel carries so much selling power in the showroom and even more on the used car lot.

For more facts about stainless steel see your supplier or write: ELECTRO METALLURGICAL COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y.

METALS DO MORE ALL THE TIME ...THANKS TO ALLOYS

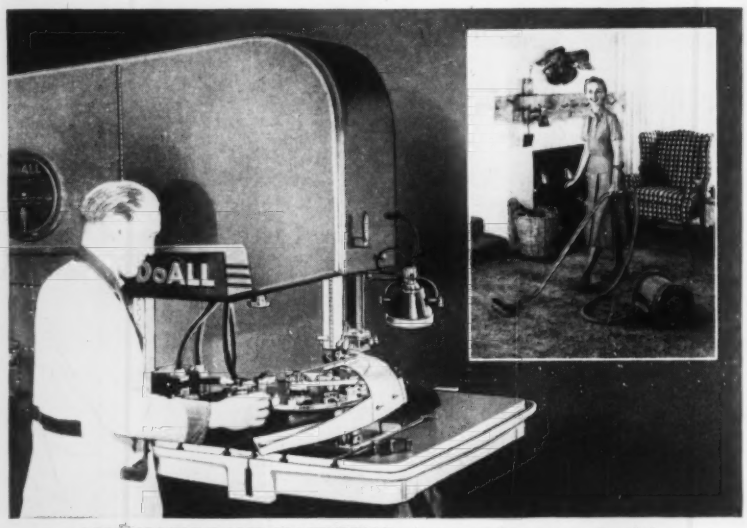
Electromet
FERRO-ALLOYS AND METALS

UNION CARBIDE



Stainless steel styling is easiest of all to sell! Body and window mouldings, wheel covers, grilles, door handles and even roofs are stainless steel this year!

The terms "Electromet" and "Union Carbide" are registered trade-marks of Union Carbide Corporation.



AUTOMATIC BAND MACHINING—increases human productivity and lowers the cost of consumer goods such as vacuum cleaners.

"Tools", Not Wages, Have Improved Living

The industrial wage earner has been doing all right. His standard of living has been rising at about 2% per year. Today, he can buy 20% more goods and services than just 10 years ago.

The real source of this gain lies not in wage increases, but in new and better tools of production. Living standards have advanced hand-in-glove with a 2% average annual increase in human productivity. Wage increases in excess of productivity increases simply have raised prices, as shown by statistics over recent years:

Annual mfg. wages increase	7%
Annual wholesale prices increase	5%
Gain for wage earner	2%

The new DoALL machine pictured above illustrates the principle. It is automatically cutting slots in vacuum cleaner parts at a rate twice that of the machine tool previously used. All the operator has to do is put the parts in the machine. A circular fixture positions each piece for cutting. The hydraulic power feed table moves the work into the continuous-cutting high speed steel saw band and backs out when the cut is completed. Finished parts are ejected automatically.

High production combined with moderate machine cost and low cutting tool cost bring unparalleled economies to cutting slot widths of .030" to .100" in a wide variety of parts. Such new and improved tooling makes possible abundant production of vacuum cleaners and other goods at prices people can pay. The reduction in costs permits payment of higher wages without corresponding increase in price of the product.

DoALL band machines equipped with simple fixtures for high production of duplicate parts offer cost reduction opportunities on thousands of machining operations. Information is available through local DoALL Service Stores that offer more than 1500 machine, cutting tool, gaging and supply items.

Reprints of this series on economics plus "economic kits" available for employee education.

E-52

LITERATURE describing DoALL band machines and band machine fixturing service available free on request. Call DoALL locally, or write.

The DoALL Company
Des Plaines, Illinois
38 Local Sales-Service Stores

LETTERS

(Concluded from Page 10)

portant basis on which to build our studies in the field of future developments. We would appreciate five copies.

Martin Vetter
Deutsche Edelstahlwerke AG
Krefeld, Germany

Aid to Salesmen

In your Oct. 14 issue, I read with great interest the ninth article in your 1957 Program for Management, "Make or Buy?" (Page 105). I believe a good understanding of this approach to the problem would be of invaluable aid to our salesmen and would like ten copies to distribute to them.

C. V. O'Hara
Manager
San Francisco Div.
Connor Spring Mfg. Co.
San Francisco

Pleased with Service

The article, "Needed: Better Training" (Nov. 18, Page 114), proved interesting. Please send an extra copy.

I was pleased with the service I received on my last request and wish to thank you.

C. B. Keiter
Assistant Chief
Production Liaison
Douglas Aircraft Co. Inc.
Tulsa, Okla.

Slated for Distribution

We have read your interesting article, "Single Stack Annealing Gets the Nod" (Nov. 11, Page 118), and would like six reprints for distribution within our department.

C. H. Windle
Superintendent
Cold Strip Dept.
Republic Steel Corp.
Warren, Ohio

Valuable Asset to Soldier

I will appreciate one copy each of the last four articles, No. 7, 8, 9, and 10, of your 1957 Program for Management. The entire series has been interesting reading and has proved to be a valuable asset in keeping abreast of business trends.

Pfc. Paul E. Mastrorocco
Quartermaster Research & Engineering Command
U. S. Army
Natick, Mass.

Concise Index of Metals

I would like six copies of the Metal Selector (Oct. 28, Page 169). It is a concise, comprehensive index of metals and will be a helpful reference in our engineering department.

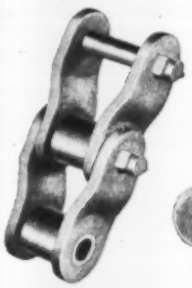
S. L. Petchul
Naval Architect
Calumet Shipyard & Dry Dock Co.
Chicago

Company Suggests Selector

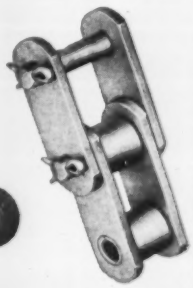
I have been advised by the Champion Rivet Co. representative in Newark, N. J., that your Apr. 1 issue contained a Welding Rod Selector. Could I obtain one? It would be useful to me in my work in the material control department of the United Fruit Co., New York.

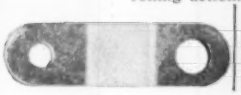
Philip H. Brimer
447 Edgewood Ave.
Westfield, N. J.

"Full-round" design of Link-Belt LXS chain avoids stress raisers



ROLLERS are accurately machined for correct operating clearances and free-rolling action.





SIDEBARS of selected steel have accurately machined "full-round" pitch holes, which maintain firm, tight press fit of pins and bushings.

FOR POWER TRANSMISSION, LXS chain is generally supplied with offset sidebars. Uniform stress distribution provides extra chain life and safe dependable operation.

FOR CONVEYING AND ELEVATING, LXS chain with straight sidebars and rollers to meet varied operating conditions. A wide variety of attachments is available.

"FULL-ROUND" PINS are made from a tough steel, specially treated for high strength in shear . . . sized for controlled press fit to prevent rotation in sidebars.

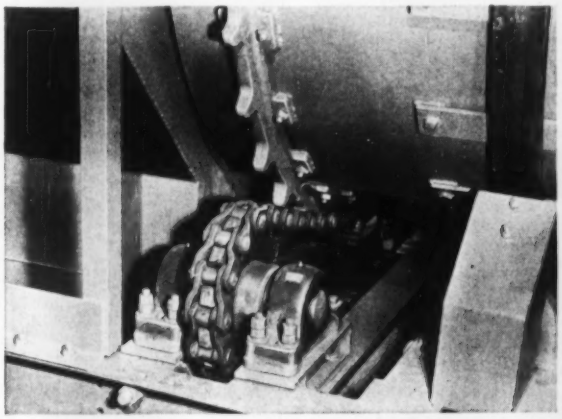
"FULL-ROUND" BUSHINGS are properly hardened to shrug off shock, resist wear . . . accurately sized for controlled press fit to prevent rotation in sidebars.

Greater live bearing area extends life

Stress concentration points are eliminated in Link-Belt LXS chain! "Full-round" design avoids sharp corners which may be the starting points of chain failure . . . provides maximum live bearing area between pin, bushing and sidebars. As a result, stress is distributed evenly . . . long chain life is assured under severe conditions.

Pins and bushings of LXS chain are accurately sized . . . assuring controlled press fits, preventing rotation in sidebars. Similar accuracy in machining of sidebars permits close control of pitch and proper chain length after assembly.

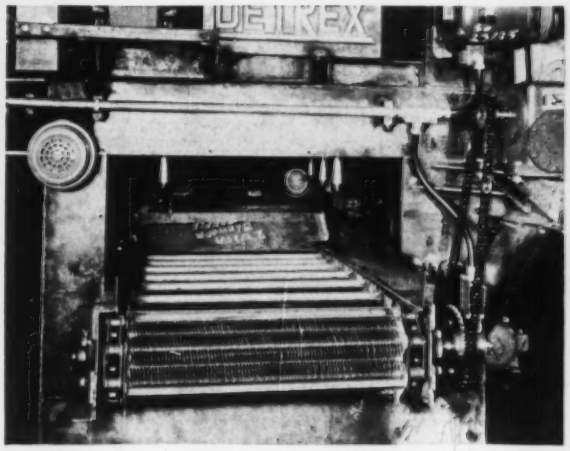
Other long-life features of Link-Belt LXS chain include use of selected steels and controlled hardening of all parts. Both contribute to greater endurance . . . greater uniformity.



LXS drives stand up to impact and abrasive service

Large, live bearing area makes LXS chain ideal for exposed drives and abrasive conditions such as found on this heavy rotating drum. Uniform distribution of load over ample bearing area reduces cutting action of abrasives . . . extends chain life.

LXS chain has stamina required for long, heavy-duty conveyors



With its exceptional strength and wear resistance, Link-Belt LXS chain can easily meet rugged conveying and elevating requirements. Due to accuracy of pitch and attachment spacing, plus close matching of multiple strands, LXS has the added strength and wear life necessary for the extra-long conveyors so important to today's highly mechanized industry.

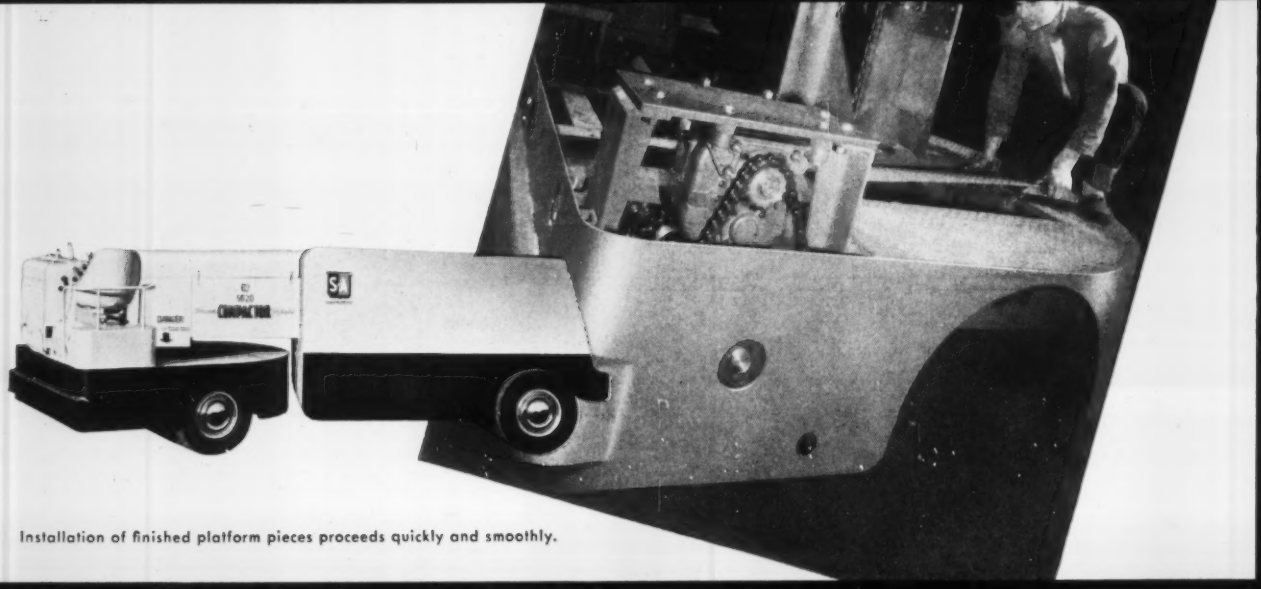
HEADQUARTERS for chains, sprockets and other Link-Belt products is your nearby Link-Belt factory branch store or authorized stock-carrying distributor. Refer to the Yellow Pages of your local Phone Directory.

LINK-BELT

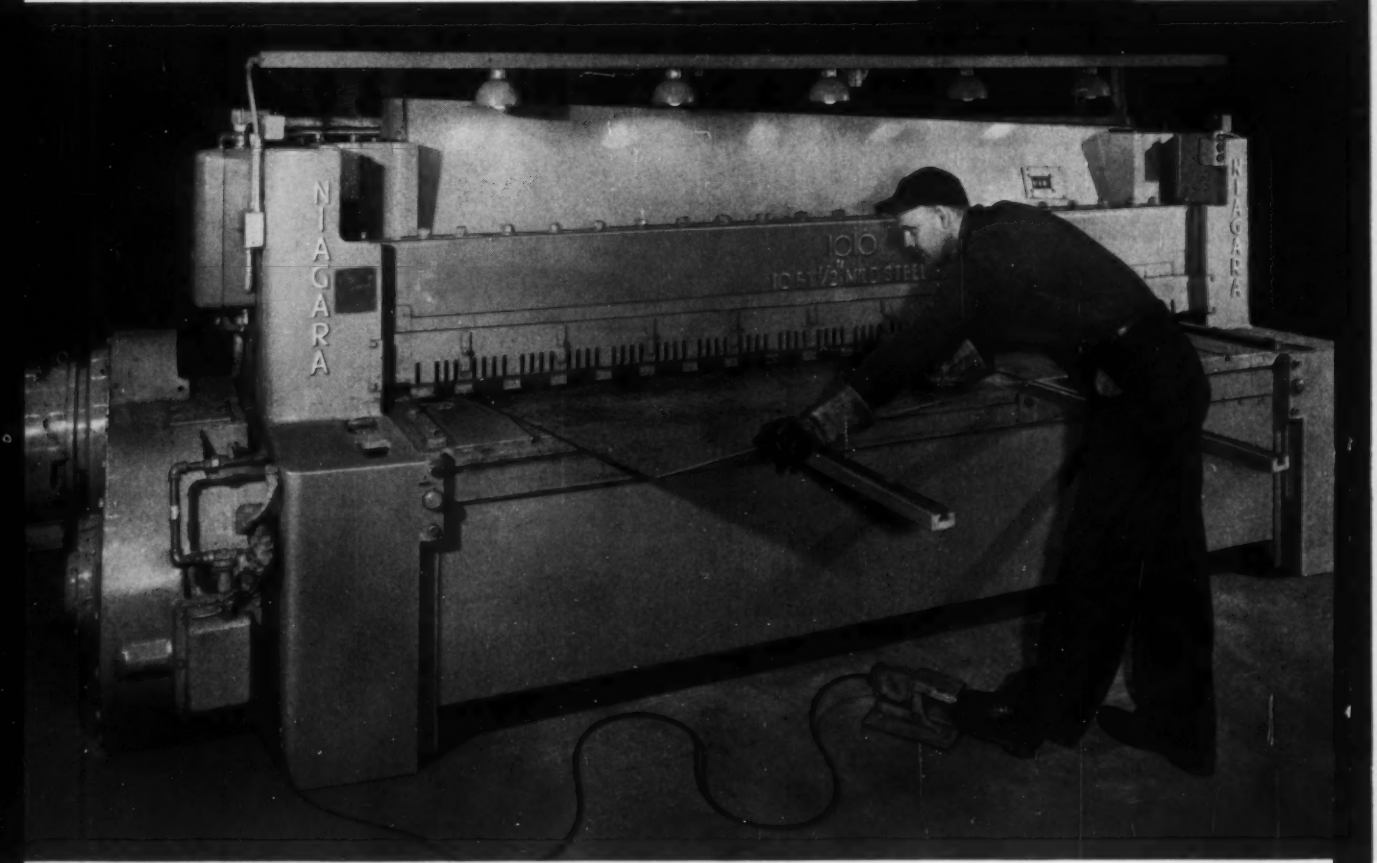
14,740

CHAINS AND SPROCKETS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.



Installation of finished platform pieces proceeds quickly and smoothly.



Niagara Model 1010 shearing 16 gage safety plate for operator's platform of Pneumatic Compactor.

NIAGARA

America's most complete line of presses, press brakes, shears, other machines and tools for plate and sheet metal work

power squaring shears

"high accuracy ...utmost speed"

...sums up Seaman-Andwall's experience with Niagara Power Squaring Shears

Wisconsin manufacturer of road construction machinery uses Niagara Underdrive Power Squaring Shears to assure high quality and peak production.

Hard at work on America's highways, Seaman-Andwall compactors, rollers and other machines are opening the way to faster, safer travel.

Meanwhile, hard at work in the Seaman-Andwall plant, a Niagara Power Squaring Shear is opening the way to faster, more economical production.

"With Niagara's Shear in operation," says Seaman-Andwall, "we are able to cut 3 to 5 tons of steel per day. *The Niagara Shear gives us a high quality of accuracy with the utmost in speed and performance.*"

Seaman-Andwall is one of numerous plate and sheet metal fabricators who are making Niagara their choice for power squaring shears. And with good reason!

WHEN IT COMES TO ACCURACY, Niagara's positive, power-actuated self-compensating holddown contacts work with low impact, grips metal securely. Rigid, fully closed box section construction of bed, crosshead, holddown and housings resists all stresses with minimum deflection. Gaging facilities are ultra-accurate. Cutting within micrometer tolerances is assured.

WHEN IT COMES TO SPEED, more working strokes per minute, plus instant engagement of Niagara's exclusive sleeve clutch assure more cuts per hour. There's no need to adjust knife clearance for different thicknesses — holddown feet are self-compensating. Fully visible cutting line, ease of operation and quick-setting gages further boost hourly output.

WHEN IT COMES TO STAMINA, Niagara Shears are built to stand up on the toughest jobs. Simple design and minimum number of parts cut costly repairs. Vital drive components operate in a sealed bath of oil.

LEARN ALL ABOUT NIAGARA SHEARS IN THIS PICTURE-PACKED BULLETIN

See Niagara Shears at work in plants across the nation. Observe every feature, every detail. Learn why Niagara Shears can do the most for you. 74-pages — 141 revealing photographs and illustrations! 19 job photo reports! Specifications for 59 standard models. (Capacities: 16 gage to 1″ mild steel. Cutting lengths: 4 to 20 ft.)

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NIAGARA MACHINE & TOOL WORKS, BUFFALO 11, N. Y.

Send your new Bulletin 69G on Niagara Underdrive Power Squaring Shears.

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NEW semi-continuous billet casting makes Mueller Brass Co. RED TIP ROD BETTER THAN EVER!!

Brass rod billets produced by the new semi-continuous process at the Mueller Brass Co. are vastly superior to those manufactured by conventional methods.

The close metallurgical controls made possible by this new automatic equipment improve still further the internal soundness and constant uniformity of the rod . . . a factor for which RED TIP ROD has long been famous.

It will lower production costs in automatic screw machines by permitting faster machining speeds while at the same time increasing tool life.

Order a supply for your next production run . . . you'll find for top quality and dependable service you just can't beat Mueller Brass Co.'s new RED TIP ROD.

For complete details on this new semi-continuous process and technical information on all copper base alloys in rod form, write today for your copy of Engineering Manual No. FM-3110.

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These OTTAWA 60 DIES PAYOFF BIG IN 3 WAYS

- ★ Buffing Time Reduced ½
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- ★ Stoning and Regrinding of Dies Reduced 75%

Write for BLUE SHEET on OTTAWA 60

This concise four-page folder gives all needed handling and shop treatment details on Ottawa 60. Included is certified laboratory information on physical characteristics, and complete data on forging, annealing, hardening, tempering, etc. *Ask for your copy.*

ADDRESS DEPT. S-961

WSW 6648

One way to increase profits is to reduce finishing costs. That's what a fabricator of hearing aid cases accomplished when he switched from regular die steel to A-L's air hardening Ottawa 60 high carbon-high vanadium grade.

Ottawa 60 dies produced stainless steel cases which were free from galling and scoring—were nearly perfect as they came out of the dies. Less than half the previous buffing time was needed to bring them to the required high finish. Rejects—which ran about 20 percent before the use of Ottawa 60—were reduced almost to the point of elimination. Also, the new Ottawa 60 dies required stoning and regrinding only a quarter as often as the standard tool steel dies they replaced.

This same manufacturer has passed along significant savings to other customers through the use of Ottawa 60. By practically eliminating rejects due to corner cracking and scoring, customers receive better stamped parts at lower per-piece cost.

Let us show how you, too, can save with A-L tool steels and, at the same time, furnish your customers a better product.

Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pa.

For nearest representative, consult Yellow Section of your telephone book.

For complete **MODERN** Tooling, call

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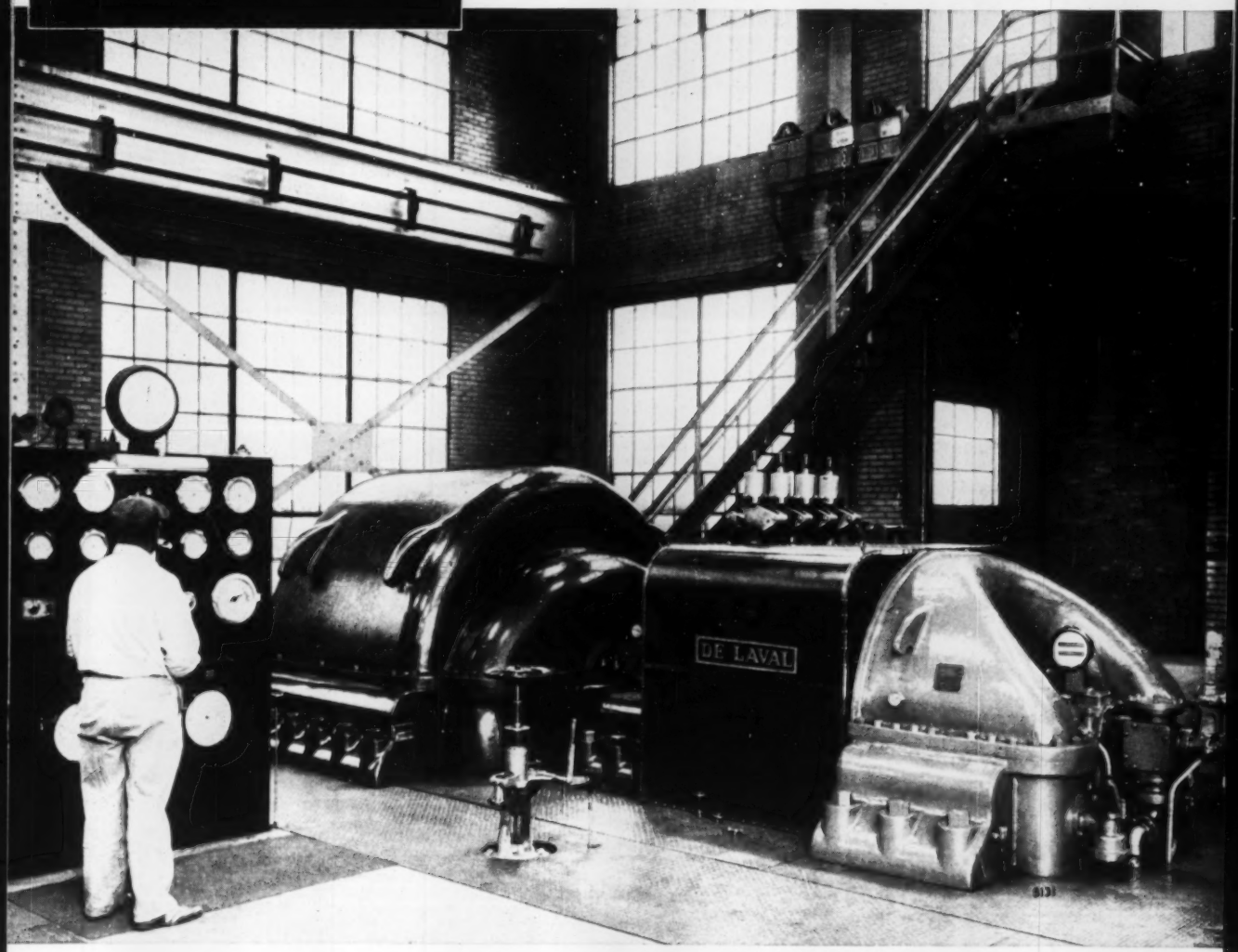
AL ® FINE TOOL STEELS SINCE 1854

DE LAVAL
BLAST FURNACE BLOWERS

give 20 years of service at Great Lakes Steel Corp.



Shown is one of two De Laval centrifugal blast furnace blowers at the Ecorse, Michigan, plant of the Great Lakes Steel Corporation, Division of National Steel Corporation. This 85,000 cfm unit was installed twenty years ago; another 75,000 cfm unit went on the line a year earlier. Both have given dependable round-the-clock service ever since. These turbine-driven blowers are hooked up to a multi-head which enables either one to be used in conjunction with any of the three blast furnaces.

De Laval centrifugal blowers are built in single and multi-stage types to supply air in volumes up to 150,000 cfm for all classes of service in steel, gas and coke plants. The wealth of application experience acquired by De Laval over the years assures a correct and economical solution to your blower problem.

Send for Bulletin 0504

DE LAVAL *Centrifugal Blowers*

DE LAVAL STEAM TURBINE COMPANY
860 Nottingham Way, Trenton 2, New Jersey

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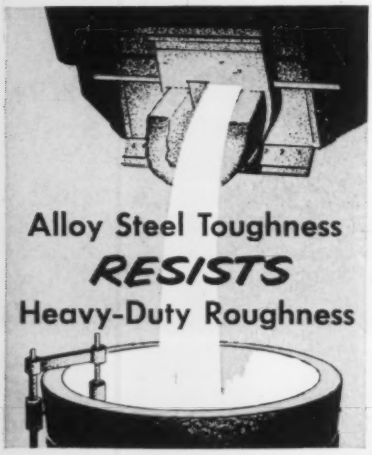
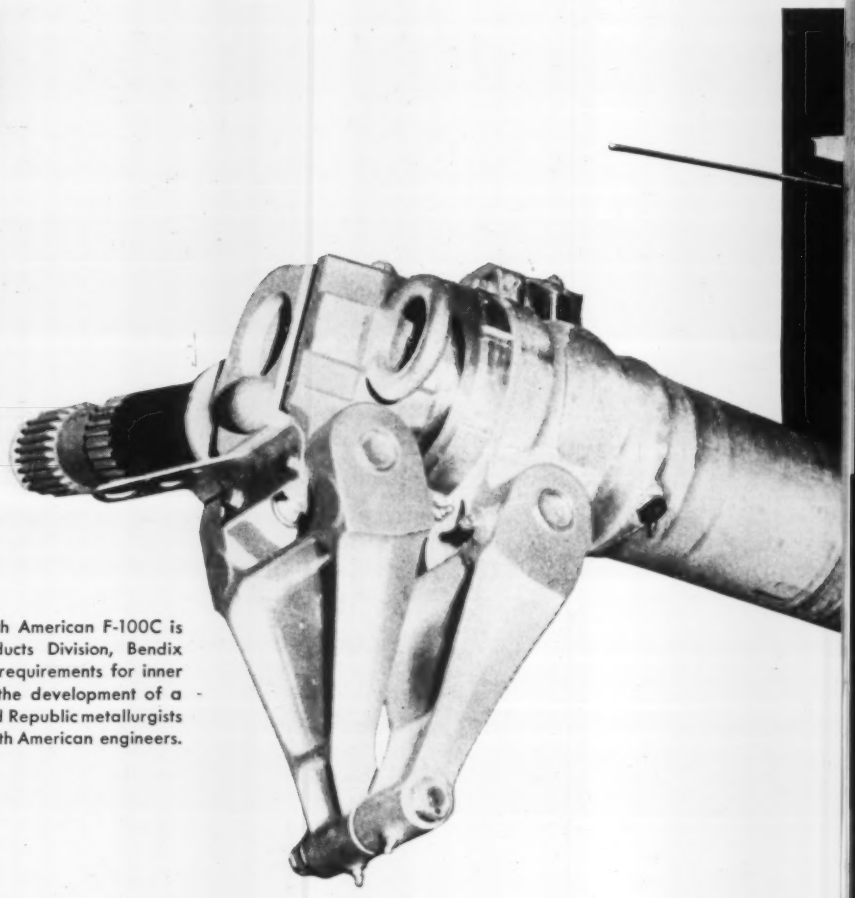




Landing-gear strut for the North American F-100C is manufactured by Bendix Products Division, Bendix Aviation Corporation. Exacting requirements for inner and outer cylinders resulted in the development of a new grade of steel by Bendix and Republic metallurgists working in cooperation with North American engineers.

How Metallurgical Teamwork Developed the Super Sabre's Tough,

When a new grade of steel is born, there's sure to be an interesting story behind it.

In this case, it's the story of close cooperation between metallurgical teams from Bendix and Republic. Their common goal: development of a tough, strong, alloy steel to withstand the shock, impact, strain and vibration of tons of aircraft hitting the runway at speeds in excess of 100 miles per hour.

It starts after World War II, when Bendix metallurgists undertook a program to correct certain characteristics and improve processing deficiencies of steels commonly used for aircraft landing gear.

Several leading steel companies, including Republic, were consulted and the program outlined. Republic immediately put its 3-Dimension Metallurgical Service Team on the problem.

The field metallurgist worked closely with Bendix metallurgists and engineers right in their own plant under actual operating conditions. Their findings were supplemented and coordinated by the other two members of the Republic team—the laboratory and mill metallurgists.

The result: development of a new grade of steel that

REPUBLIC

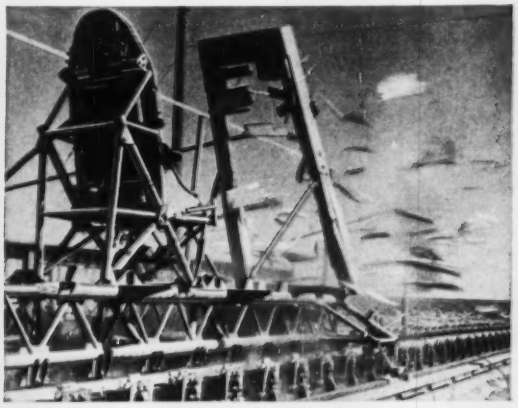
REPUBLIC STEEL

World's Widest Range of Standard Steels

Strong, Alloy Steel Landing Gear

was found ideal for application in the strength range of 220,000-240,000 psi. This steel, designated AMS 6427 by the SAE, offers maximum resistance to fatigue. Provides an exceptionally high strength-to-weight ratio. Maintains its great strength at wide temperature extremes. Responds uniformly to heat-treatment, producing hard, wear-resistant surfaces around tough cores.

Are you sure you are using the right steel? Why not make sure by using Republic's 3-D Metallurgical Service to assist you in a check-up? It's confidential. There's no obligation. Just send us the coupon.



WHERE STRENGTH IS AN IMPORTANT REQUIREMENT—such as this rocket sled for deceleration tests—manufacturers choose tubing for basic construction. At any given weight, tubing is strongest of all mechanical shapes . . . as a beam . . . in torsion . . . under compressive loads. Republic ELECTRUNITE® Steel Mechanical Tubing, the original electric resistance welded tube is well known for quality and performance. It's available in carbon and stainless steel in a wide variety of sizes, shapes and gages. Send coupon for more facts.

HIGH STRENGTH AND LIGHTWEIGHT ADVANTAGES of Republic Titanium are adding range, speed and maneuverability to both military and commercial aircraft. In the Navy's HOK-1, sections fabricated from Republic Titanium, Type RS-70 Annealed are used as the firewall between pilot and engine compartments. But, titanium should not be looked upon as strictly an aircraft or military metal. Its extremely high resistance to most forms of corrosion makes it attractive for use in processing and chemical equipment, heat exchangers, dehydration trays, anodizing racks, etc. Mail coupon for more information.

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and Steel Products

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Send more information on:
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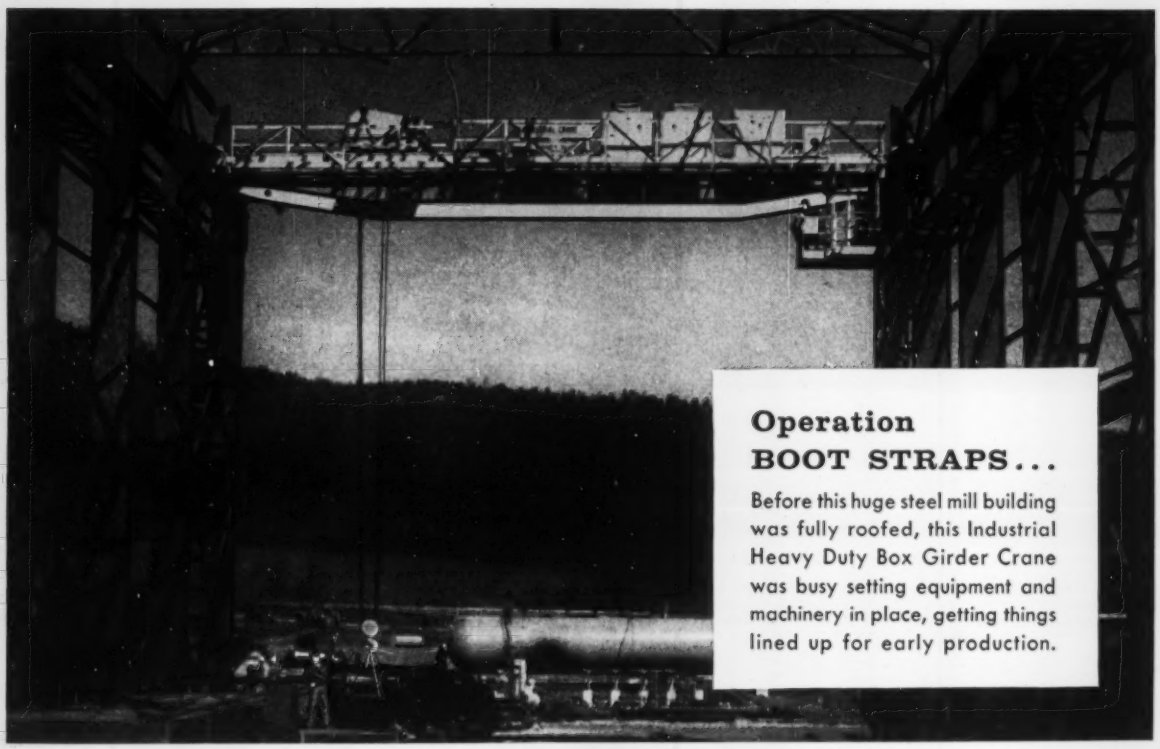
Think of Industrial First!



Operation BOOT STRAPS...

Before this huge steel mill building was fully roofed, this Industrial Heavy Duty Box Girder Crane was busy setting equipment and machinery in place, getting things lined up for early production.

Industrial
Heavy-Duty
Box Girder Crane

Another in the versatile Industrial line

- Heavy duty MCB bearings on end trucks and trolley
- Precision machined components
- All welded box girders with built-in camber
- Wide choice of electrical controls
- Rolled forged steel bridge and trolley wheels
- Open or closed full vision operator's cab
- Full length walkways and completely decked trolleys

In planning your new building specify

Industrial

HEAVY DUTY CRANES

When designs for new plants are in the formulative stages it is wise to call *Industrial* Crane Engineers and reap the benefit of their experience and careful attention to details in planning the overhead crane systems.

Greater economy can be effected by designing an efficient handling system that fits your needs into the original structure rather than adapting an operation to the structure afterwards.

Be sure to specify *Industrial* heavy duty cranes. You'll enjoy the benefits of economical crane performance because *Industrial* cranes combine rugged dependability with ease of maintenance.

Industrial cranes are today's best values

Industrial makes many other types of Overhead Traveling Cranes and Jib Cranes to fill any materials handling need. Write for information and catalogs.

Industrial CRANES

HD-657C

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Export Sales: Borg-Warner International, 36 South Wabash Ave., Chicago 3, Illinois

CALENDAR

OF MEETINGS

1958

Jan. 6-8, Southern Industrial Distributors' Association: Midyear meeting, Roosevelt Hotel, New Orleans. Association's address: 1626 Fulton National Bank Bldg., Atlanta 3, Ga. Secretary: E. L. Pugh.

Jan. 13-17, Society of Automotive Engineers Inc.: Annual meeting, Sheraton-Cadillac and Statler Hotels, Detroit. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Jan. 13-15, American Management Association: Special conference on developing new products, Roosevelt Hotel, New York. Association's address: 1515 Broadway, New York 36, N. Y. Secretary: Andrew P. Donovan.

Jan. 13-15, Compressed Air & Gas Institute: Annual meeting, Seacrest Manor, Hollywood, Fla. Institute's address: 122 E. 42nd St., New York 17, N. Y. Secretary: Frank P. Anderson.

Jan. 16-17, National Industrial Conference Board Inc.: General session for all associates, Hotel Commodore, New York. Board's address: 460 Park Ave., New York 22, N. Y. Secretary: Herbert S. Briggs.

Jan. 17, Malleable Founders' Society: Semiannual meeting, Hotel Cleveland, Cleveland. Society's address: 1800 Union Commerce Bldg., Cleveland 14, Ohio. Executive vice president: Lowell D. Ryan.

Jan. 19-22, Institute of Scrap Iron & Steel Inc.: Annual meeting, Eden Roc, Fountainebleau, and Deauville Hotels, Miami Beach, Fla. Institute's address: 1729 H St. N. W., Washington 6, D. C. Executive vice president: Edwin C. Barringer.

Jan. 20-21, Compressed Gas Association Inc.: Annual meeting, Waldorf-Astoria Hotel, New York. Association's address: 11 W. 42nd St., New York 36, N. Y. Secretary: F. R. Fetherston.

Jan. 20-22, Truck Trailer Manufacturers Association: Annual meeting, Palm Beach Biltmore Hotel, Palm Beach, Fla. Association's address: 710 Albee Bldg., Washington 5, D. C. Managing director: John B. Hulse.

Jan. 20-23, American Road Builders Association: Annual meeting, Sheraton-Park Hotel, Washington. Association's address: 600 World Center Bldg., Washington 6, D. C. Executive vice president: Louis W. Prentiss.

Jan. 21-22, Steel Shipping Containers Institute Inc.: Winter meeting, St. Regis Hotel, New York. Institute's address: 600 Fifth Ave., New York 20, N. Y. Secretary: L. B. Miller.

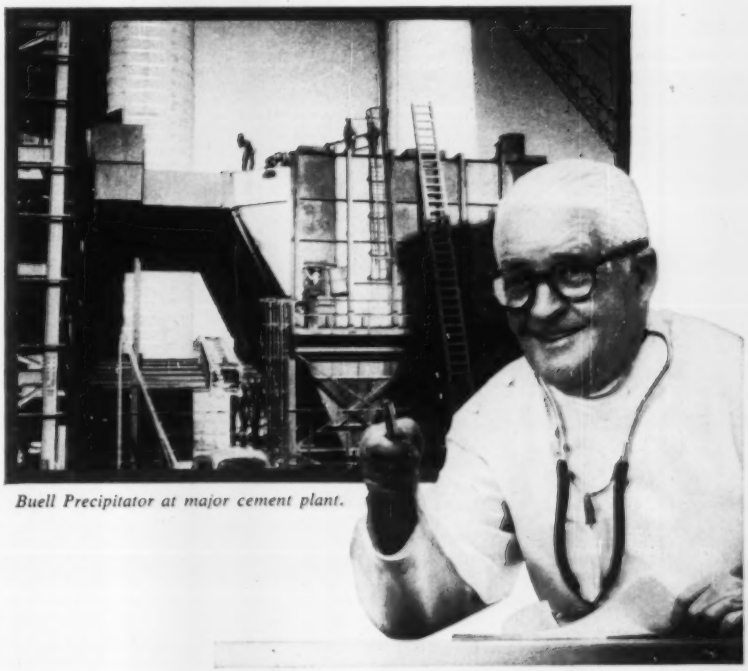
Jan. 26-Feb. 2, Association of Steel Distributors Inc.: Convention, Algiers Hotel, Miami Beach, Fla. Association's address: 29 Broadway, New York 6, N. Y. General counsel: Morris Rosoff.

Jan. 27-28, Industrial Heating Equipment Association: Annual meeting, Penn Sheraton Hotel, Pittsburgh. Association's address: Associations Bldg., Washington 6, D. C. Executive vice president: Robert E. Fleming.

Jan. 27-30, Plant Maintenance & Engineering Show and Conference: International Amphitheatre, Chicago. Information: Clapp & Poliak Inc., 341 Madison Ave., New York 17, N. Y.

Jan. 30-31, Steel Plate Fabricators Association: Annual meeting, Roosevelt Hotel, New Orleans. Association's address: 105 W. Madison St., Chicago 2, Ill. Secretary: J. Dwight Evans.

Feb. 3-7, American Institute of Electrical Engineers: Winter general meeting, Statler and Sheraton-McAlpin Hotels, New York. Institute's address: 33 W. 39th St., New York 18, N. Y. Secretary: N. S. Hibshman.

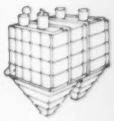


Buell Precipitator at major cement plant.

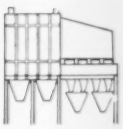
Specialists in treatments for the flue

Hundreds of installations have proved the extra efficiency of Buell Dust Collection Systems. In mechanical collectors, only Buell cyclones have the exclusive Shave-off that traps an extra percentage of dust, large-diameter design that eliminates bridging and clogging. In electrical collectors, only Buell "SF" precipitators have features like high-emission, failure-proof Spiralectrodes. The results are high collection efficiency, freedom from shut-downs, minimum or no maintenance year after year in every Buell installation. Get the full story in "The Collection and Recovery of Industrial Dusts." Write Dept. 26-L, Buell Engineering Company, Inc., 123 William Street, New York 38, New York.

BUELL CYCLONE



"SF" ELECTRIC PRECIPITATORS



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Experts at delivering Extra Efficiency in

DUST COLLECTION SYSTEMS

It's your final cost that counts when you buy stainless steel plate and plate products

Don't be misled by the "lowest quote"—not if you want quality stainless steels with the lowest *final* cost in your shop. Put your confidence in the supplier who gives you *what* you want, the *way* you want it, *when* you want it.

At Carlson, for example, your order is filled by experienced men who take a personal interest in it.

- You save true-up time—plates are sheared square and accurate
- You save assembly time—all machined pieces are right to your print
- You save freight and scrap handling costs—pieces are properly cut to sketch
- You can deliver on schedule and get repeat business

Remember, it's your *final* cost that counts. When you want stainless steel for your next job—put Carlson to the test.

G.O.CARLSON *Inc.*

Stainless Steels Exclusively

THORNDALE, PENNSYLVANIA

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PLATES • PLATE PRODUCTS • HEADS • RINGS • CIRCLES • FLANGES • FORGINGS • BARS and SHEETS (No. 1 Finish)

Quality in Ascendancy

The superiority of the vast number of products that are—and can be made from Roebling Cold Rolled Flat Spring Steel is a fact known throughout all industry.

You pay for mechanical and dimensional uniformity when you buy flat spring steel...you *get* it when you buy Roebling.

For information on how our products can help *yours*, write Wire and Cold Rolled Steel Products Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

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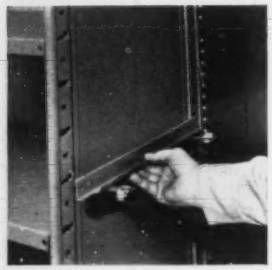
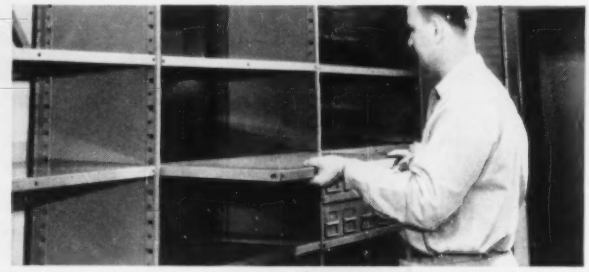
Roebling... Your Product is Better for it

Only New HALLOWELL *ERECTOMATIC*® Steel Shelving

has a time-saving, positive built-in lock—plus these features:





FAST ASSEMBLY. Just position the shelf supports, insert the shelf, press the locks. Straight-in, straight-out shelf change. No tilting. No dismantling. No interference with any other shelf.

New Hallowell ERECTOMATIC* steel shelving goes up fast, can be rearranged in seconds. It's the unique built-in locking device* that cuts assembly time, speeds repositioning of shelves. Here's how easy it is! To position a shelf—slide it into place on the shelf supports, press the locks, and the job is done. To reposition a shelf—release the locks, pull the shelf straight out, slide it straight in on the supports at its new location, and press the locks. It takes only seconds to complete the move.

New Hallowell ERECTOMATIC steel shelving is available in all types, too. Open, closed, bin units, ledge units, counter units, and cabinets are made of prime steel, phosphate coated, and finished in baked-on enamel. Standard is SPS green, other colors are available.

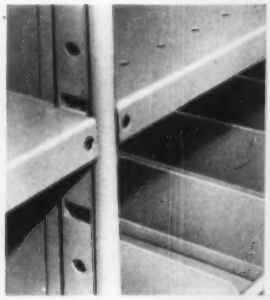
Investigate new Hallowell ERECTOMATIC before ordering shelving. You'll find it stocked by leading industrial distributors and shop equipment dealers everywhere. Contact the one nearest you. Or write Hallowell Shop Equipment Division, STANDARD PRESSED STEEL CO., Jenkintown 33, Pa.

*Patent applied for

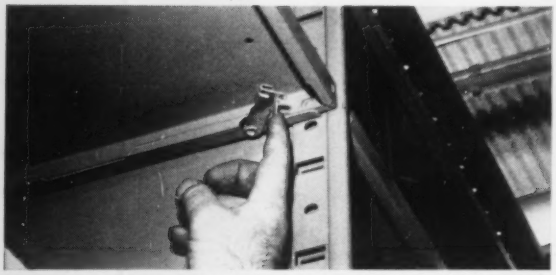
INDEPENDENT SHELF POSITIONING. Each shelf can be individually repositioned in seconds.

FULL USE OF SHELF AREA. No tees or angles, and beaded posts save valuable space.

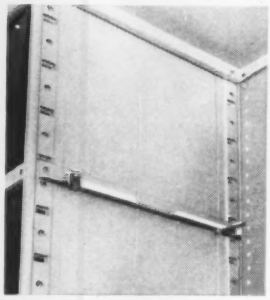
COMMON SIDE PANELS AND POSTS save material between adjacent units in rack. Back and side panels are one-piece.



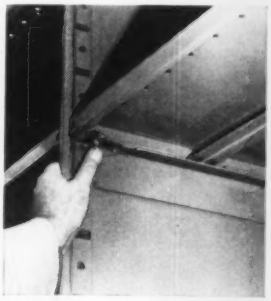
BEADED POSTS AND FLANGED SHELVES prevent snagging of clothing or stored goods, protect workers.



QUICK SHELF CHANGE. Release the locks, remove the shelf and its supports, relocate, and press the locks.



FULL DEPTH SHELF SUPPORT. No buckling possible. Reinforcements can be added when they are required.



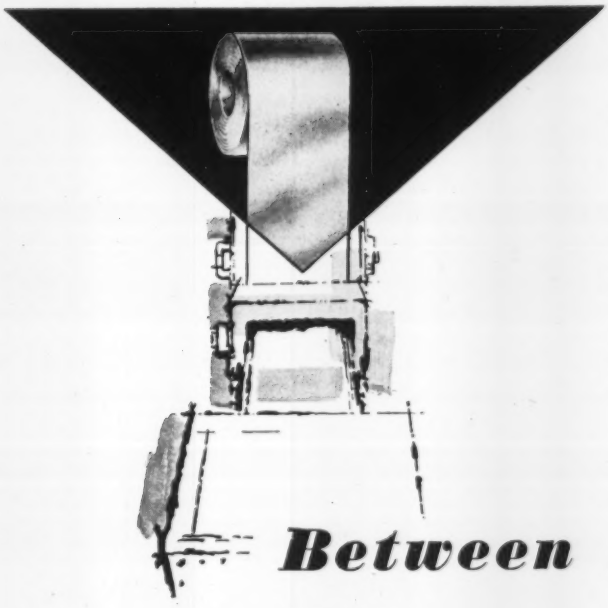
4 CLASSES OF SHELVES. Regular, medium, heavy and extra-heavy construction meets all load requirements.

HALLOWELL® SHOP EQUIPMENT DIVISION

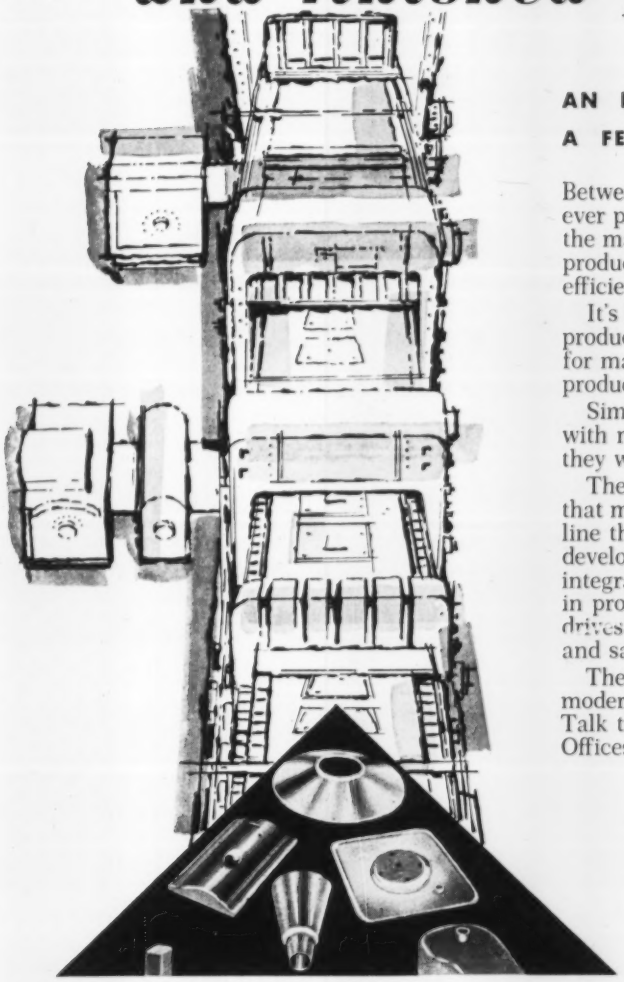
STANDARD PRESSED STEEL CO.

SPS

JENKINTOWN PENNSYLVANIA



Between material and finished part...



AN IDEA THAT MAKES SENSE —
A FEDERAL-WARCO PRODUCTION LINE

Between material and finished part is the ever present problem of bringing together the machinery necessary to perform all production on operations as speedily and efficiently as possible.

It's here, the Federal-Warço, this packaged production line has proved to be the answer for many of the nation's foremost production experts.

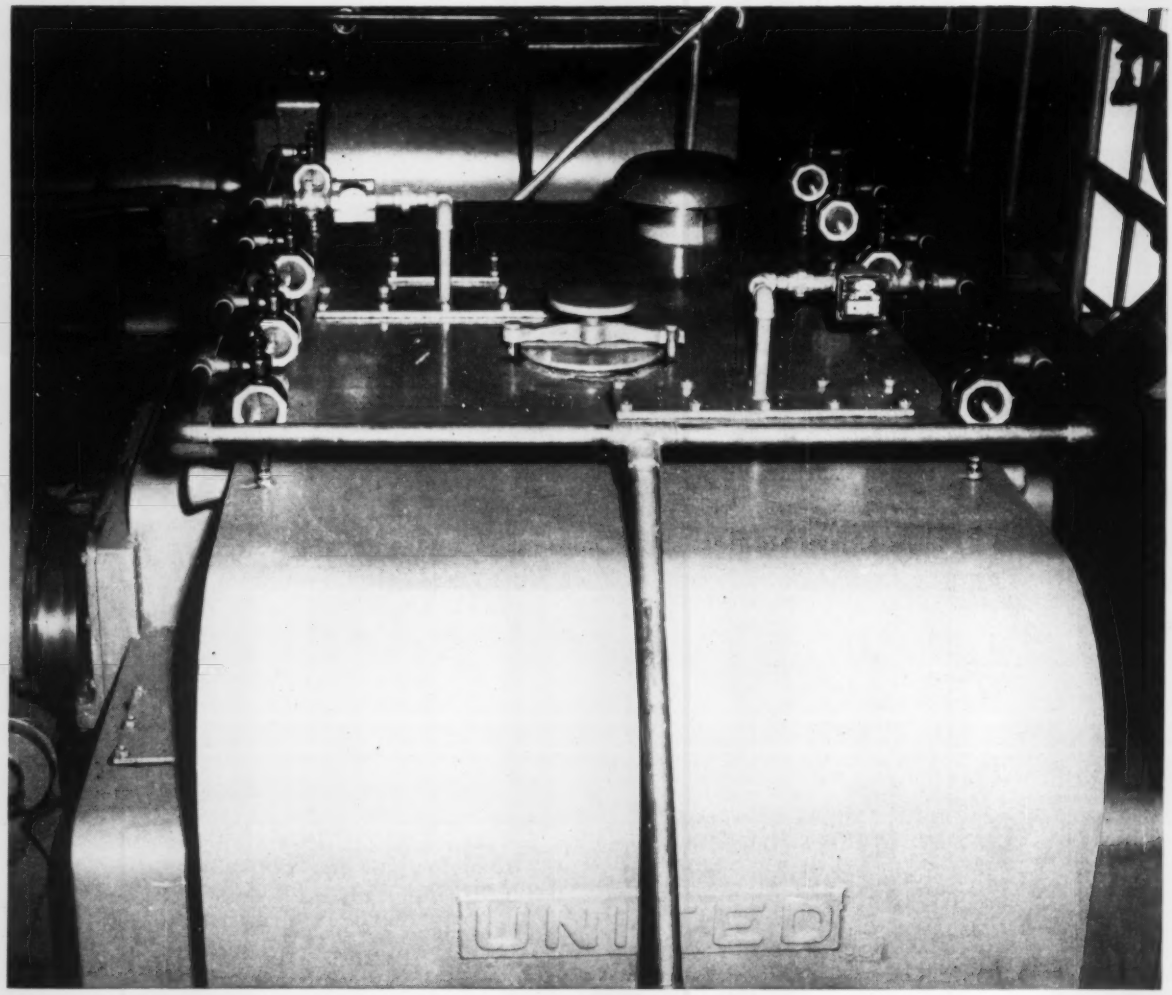
Simply provide Federal-Warco engineers with material and part information and they will develop a line to do the job.

The advantages: One source responsibility that means faster, more thorough service; a line that is 100% harmonic, all stations developed especially to work in synchronization; integrated and automated handling of work in process; the possibility of utilizing common drives and bases, reducing operating costs and saving valuable floor space.

There is much more. Why not look into this modern method of production line manufacture? Talk to your Federal-Warco representative. Offices in all leading industrial areas.

Federal / Warco
PACKAGED
PRODUCTION LINES

123 THE FEDERAL MACHINE AND WELDER COMPANY • WARREN, OHIO



How Texaco Meropa Protects Gear Drives Against Heavier Loads, Higher Speeds

The trend toward heavier loading and higher speeds means increased output at lower unit cost, but it calls for greater attention to lubrication needs. *Texaco Meropa Lubricants,* for example, designed for severe service conditions, are extreme pressure lubricants that cushion metal surfaces against wear, allow gears to operate smoothly. Special polar additives in *Meropa* effectively maintain a protective oil film during heavy shock loads.

There is a full line of *Texaco Meropa Lubricants,* whose high load carrying capacity exceeds all requirements of main drive units, and other steel mill machinery. Let an experienced Texaco Lubrication Engineer suggest the best ones for your conditions. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

☆ ☆ ☆

The Texas Company, 135 East 42nd Street, New York 17, New York.

TEXACO

TEXACO Meropa Lubricants

FOR STEEL MILL GEAR DRIVES

Metalworking Outlook

Missile Memo: Where Do We Stand?

Successful firing of the Atlas ICBM last week brought an Air Force announcement that the missile will be operational by the end of 1959. High AF sources also report a speedup in the Titan ICBM program, which is running about a year behind the Atlas. Of importance to metalmen: All our larger missiles (with the exception of their nose cones) have steel and aluminum structural members and skins. J. R. Dempsey, chief of the Atlas program at Convair Div., General Dynamics Corp., states there's nothing "esoteric or unusual" about the metals used. An official of Martin Co.'s Titan project reports no need for glamour metals because missiles are designed to last such a short time. Mr. Dempsey reveals the cost of the larger missiles (not counting the warhead and research and development): $2 million for an ICBM; $1 million to $1.5 million for an IRBM.

Missile Memo: Production Problems

A speedup in the Titan program does not mean it will go into production. Defense's missile boss, William Holaday, still contends it must be test fired before production will be considered. Mr. Dempsey emphasizes that one test is not significant, even if it is successful. "Conclusions can be drawn only from a series of tests." Further compounding the missile picture: Peter Schenk, General Electric Co.'s missileman, notes that "every weapon is obsolete when it goes into the hardware stage." How many Atlas, Titan, Thor, or Jupiter birds we'll produce depends upon how fast we bring up new and better missiles. Another point: We still have not produced a nose cone for an ICBM, and only one IRBM has successfully re-entered the atmosphere. Avco Mfg. Co.'s Dr. Arthur Kantrowitz suggests we do at least know what is needed for the nose cone. Presumably, a breakthrough is not too far off.

Missile Memo: Plans for More Sputniks

"The Russians are rushing to complete the construction of Sputnik V, weighing over a ton and equipped with television receivers and transmitters. The Soviets aim to place it in an orbit 22,000 miles above the earth. It will have the potential to jam our early warning radar system, jam radio and TV communications, and broadcast Russian propaganda on any TV channel in the world," claims Rep. James T. Patterson (R., Conn.). Other sputnik rumors: No. III will release nitrous oxide at intervals to leave a glowing trail across the sky; No. IV may be a short-lived vehicle for upper atmospheric studies on the recovery of sputniks containing test animals.

Goodrich Sees Economic Bounce

An upturn in business in mid-1958 will be "so substantial that the growth trend in general business will be continued," predicts Joseph A. Hoban,

Technical Outlook—Page 65 Market Outlook—Page 91

vice president of marketing for B. F. Goodrich Co. He bases his optimism on a resurgence in consumer buying next year.

What 13 Economists Predict

Not quite so optimistic are 13 economists participating in the National Industrial Conference Board's Economic Forum. The consensus: Gross national product in '58 will be off, but only slightly from the current annual rate of $440 billion; unemployment will rise to an average of 3.6 million in the first half, compared with 3 million in this quarter.

Record Sales for Westinghouse

Westinghouse Electric Corp. is as optimistic as Goodrich. The electric company billed $2 billion in 1957 sales, the highest in its history. It expects an even better performance in 1958. The increase next year will result from steady growth in the electrical industry, an expected modest boost in consumer goods sales, and greater emphasis on electrical and electronic components in missiles and other defense equipment.

Unions Bigger, Richer

U. S. labor union dues will total $620 million this year, up $162 million from 1955, says the National Industrial Conference Board. Of 191 unions surveyed, 45 have raised dues since 1955. A membership of 18.4 million is claimed by the 191 labor groups, compared with 17.5 million in 1955.

Holiday Doings

Most metalworking plants will operate on a reduced shift basis on Tuesday, Dec. 24, and on Tuesday, Dec. 31. A survey by Associated Industries of Cleveland of 75 representative Cleveland firms shows that only 4 will be closed all day today (Dec. 23), while 20 will be down entirely on Dec. 24. Because of the prevalence of a seventh paid holiday in the form of two half-holidays on Christmas and New Year's eve, hourly paid workers of most firms operating on reduced shifts Dec. 24 and 31 will get half-days off with pay.

Straws in the Wind

J. I. Case Co. has received $100 million in orders for its new line of farm equipment . . . Pennsylvania Railroad is inviting car builders to find more uses for plastics in freight cars . . . New York Shipbuilding Corp., Camden, N. J., will build a $21-million merchant ship for the U. S., powered by a nuclear plant under construction by Babcock & Wilcox Co., New York . . . General Electric Co. has cut prices about 4.5 per cent on pole-type distribution transformers.

JOE'S HAVIN' A TOUGH TIME EXPLAININ' THAT ONE TO THE OLD MAN.
HE SHOULD OF PUT TRUNIONS ON IT AND BRICKED IT UP AS A NEW LADLE.
WHEN HE TAPPED THAT ONE IT WAS COLD ENOUGH TO PUT THE LIGHTS OUT.
THANKS TO DONALD STANTON, SENIOR PRACTICE MAN ALGOMA STEEL CORP., LTD. SAULT STE. MARIE, ONTARIO.
HUEKES

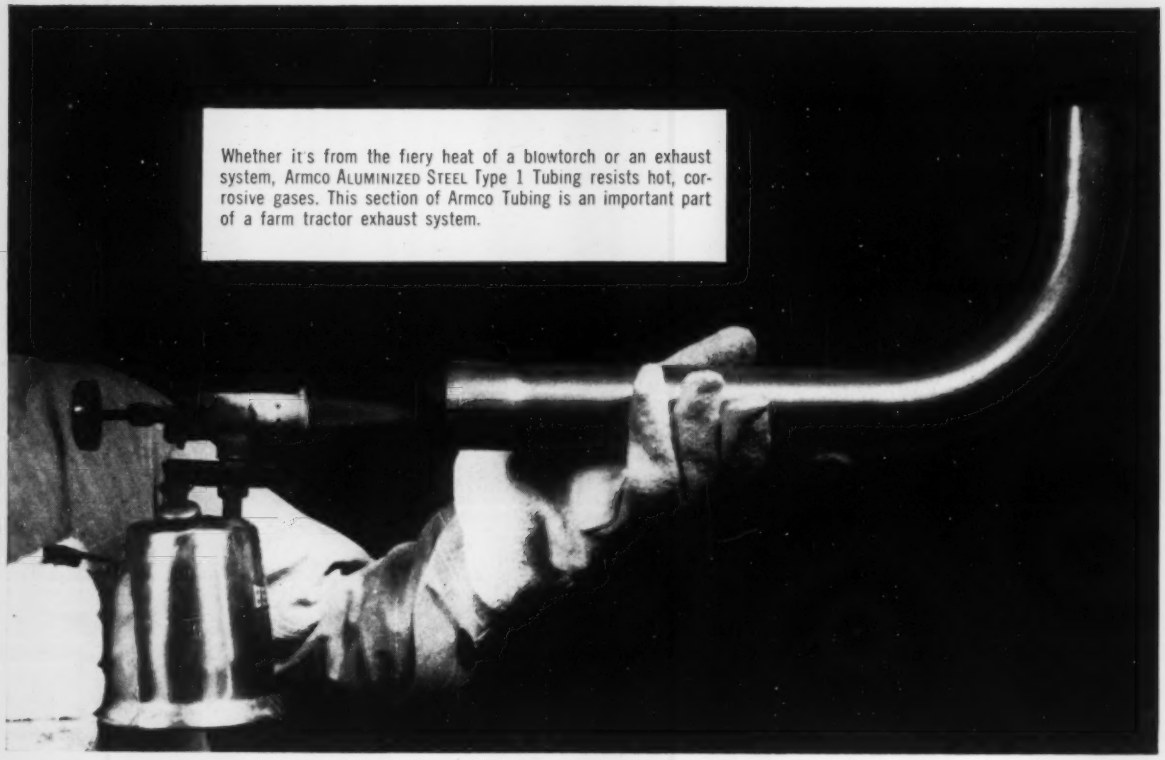
The Big Alibi

WHY NOT DESCRIBE YOUR OPEN HEARTH CARTOON IDEA AND SEND IT ALONG TO US?

The benefits steelmakers obtain from our refractories are in part a result of Basic's on-the-job servicing. One of the rewards of this close relationship has been the opportunity to observe and appreciate the lighter side of these usually serious craftsmen.

BASIC INCORPORATED 845 HANNA BUILDING • CLEVELAND 15, OHIO

when tubular parts MUST resist combined heat, corrosion ...Specify Hot-Dip Aluminum-Coated Armco Steel Tubing



Whether it's from the fiery heat of a blowtorch or an exhaust system, Armco ALUMINIZED STEEL Type 1 Tubing resists hot, corrosive gases. This section of Armco Tubing is an important part of a farm tractor exhaust system.

Try economical Armco ALUMINIZED STEEL® Type 1 Tubing for your fiery jobs. Inside and out it's protected against heat and corrosion by a durable coating of hot-dip aluminum.

In fact, ALUMINIZED STEEL Type 1 Tubing offers resistance to combinations of heat and corrosion that is unmatched by any other metal tubing in its price class.

STRONG BUT LIGHTWEIGHT

Although this tubing has the strength of steel, it is relatively light. For example, 18 gage, 1-inch O.D. ALUMINIZED STEEL Tubing weighs only about ½-pound per lineal foot. It is available in O.D.'s from ¼-inch to 3 inches, depending on gage; gages from 13 to 20, depending on O.D. The aluminum coating is replaced on the outside seam after the tubing is welded.

For outdoor applications, Armco produces another aluminum-coated grade—Armco ALUMINIZED STEEL Type 2 Tubing. It provides excellent atmospheric corrosion resistance. Still another special grade, Armco ZINCGRIP® Steel Tubing, has a tightly-adhering hot-dip coating of zinc that will not flake or peel during the severest fabrication.

Fill in and mail the coupon for full information about any of these rust-resisting Armco Steel Tubing grades.

ARMCO STEEL CORPORATION
1877 Curtis Street, Middletown, Ohio
Send me more data about these special Armco Tubing grades:

☐ ALUMINIZED STEEL Type 1 ☐ ZINCGRIP Steel
☐ ALUMINIZED STEEL Type 2

Name_____ Title_____
Firm_____
Street_____
City_____ Zone____ State_____

ARMCO STEEL CORPORATION
1877 Curtis Street, Middletown, Ohio

SHEFFIELD STEEL DIVISION • ARMCO DRAINAGE & METAL PRODUCTS, INC. • THE ARMCO INTERNATIONAL CORPORATION

Do Unto Others...

"And as ye would that men should do to you, do ye also to them likewise." Luke vi, 31.

The Golden Rule is one of the few simple truths we have in this complicated age of sputniks and flying saucers.

But how many people do you know who practice it?

We tend to forget it especially during periods of intense business activity when unbridled ambition and general indifference take precedence over what we'd call plain old fair dealing and doing an honest day's work.

Like most great truths, it is the sum of a large number of little things that apply to everyone, from the big boss down to the newest employee in the plant.

We think of the Golden Rule in business in these terms:

- Creating the right atmosphere in which people can do their best work.
- Giving recognition to the status of the individual.
- Keeping people informed.
- Encouraging the generation and cross-fertilization of ideas.
- Placing responsibility.
- Being tolerant.
- Giving credit, not discredit.
- Practicing integrity.
- Being enthusiastic.

If we observed only those nine points, we could have Christmas 365 days of the year.

Irwin H. Such

EDITOR-IN-CHIEF

Which one?

The right choice is a call to Ryerson

You can be sure you're getting the right tubing for the job—with the services of a Ryerson tubing specialist as close as your telephone.

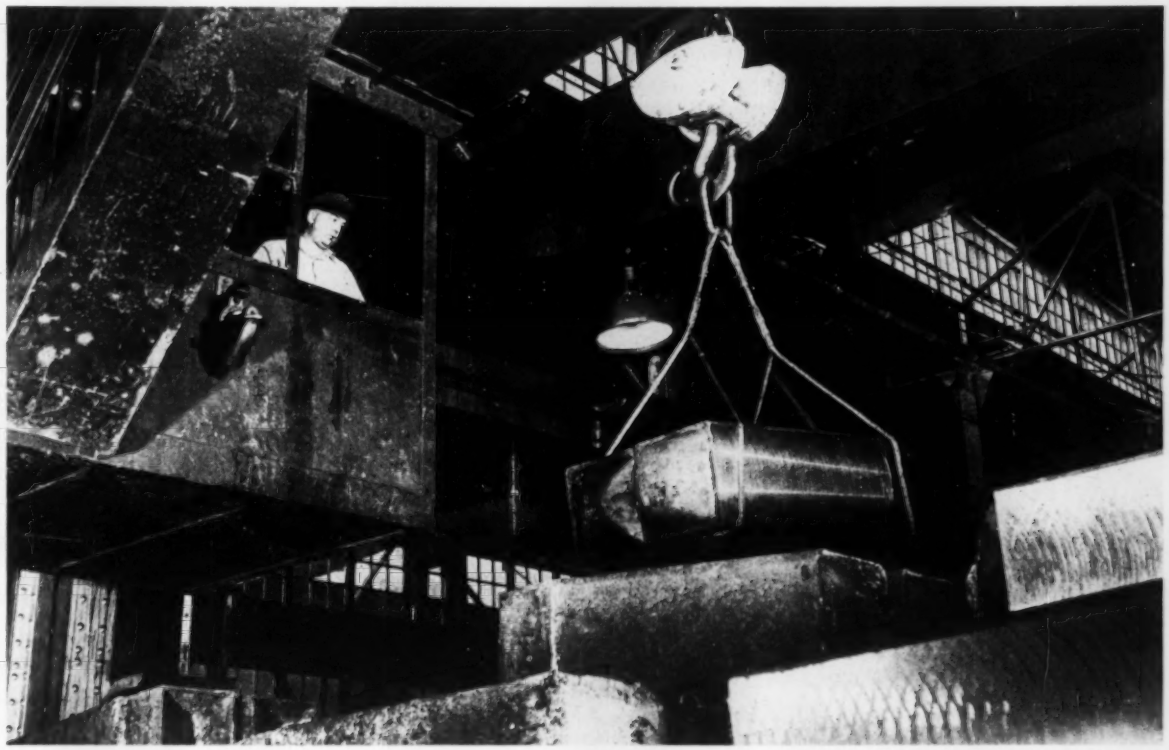
This man knows tubing—and tubing applications. He knows what will work and why. In many cases, he can recommend a type that will do a better job for you—perhaps a newer type that will save you money, either in first cost or in the cost of using it.

What's more, he offers the nation's largest stock of tubing, plus Ryerson's fast delivery. Give him a call today.

RYERSON STEEL

Tubing in Stock: Seamless and welded mechanical tubing; fluid line, pump cylinder and structural pipe and tubing; polyvinyl chloride pipe and tubing; and aluminum tubing in many Ryerson plants.

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • WALLINGFORD, CONN. • PHILADELPHIA • CHARLOTTE • CINCINNATI • CLEVELAND
DETROIT • PITTSBURGH • BUFFALO • INDIANAPOLIS • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE



International Nickel Co.

Plenty of Nickel Now

Production gains, coupled with lower government takes, have put this metal in oversupply. A big production spurt will come in 1960-61. Demand down some this year

NICKEL supplies outstrip demand for the first time since pre-Korean War days. That's a complete reversal of the year-ago situation when civilian consumers weren't getting enough to fill their needs.

Why This Change?—For several years, defense takes and the stockpile have siphoned off large chunks of nickel from the civilian economy. The reduction in stretchout in defense orders this year and the diversion of nickel scheduled for delivery to stockpile have eased the situation. Two other factors affecting the supply: 1. A drop in demand from some industries which have felt the business pinch. 2. More production in 1957.

Free World production this year should reach 244,000 tons (see table, Page 36), though some industry people believe the figure could hit 250,000 tons. That compares with 231,000 tons in 1956 and 215,000 tons in 1955.

At the same time, consumption has dropped. Estimates peg U. S. consumption this year at 125,000 tons (though some see the figure closer to 127,500 tons). In 1956, domestic consumption was 127,578 tons; in 1955, 110,000 tons.

Downturn — Actually, producers are selling most of their market price nickel this year, although with greater difficulty. Says L. R. Larson, vice president and manager of sales, International Nickel Co., New York: "We're moving our market price nickel but not necessarily in the forms we want to sell it." For example, Inco has had to put some of its oxide sinter into other forms before customers would take it.

But it's a different story with premium price nickel. With the market grade (74 cents a pound) in adequate supply, consumers aren't about to pay more for the metal.

This softness in the 1957 nickel picture is easy to pinpoint. Besides the slight cloudiness in the business climate and the stretchout in

Prospects for Nickel

(in tons)

Free World production rising . . . . . **So is U. S. consumption**

	CANADA	U. S.	CUBA	OTHER*	TOTALS	
1961	240,000	10,000	50,000	37,500	337,500	175,000
1957	180,000	9,000	22,500	32,500	244,000	125,000
1956	178,750	6,700	16,050	29,500	231,000	127,578
1955	174,950	3,800	15,150	21,100	215,000	110,000

Source: U. S. Bureau of Mines and STEEL estimates.
*Includes New Caledonia, Japan, South Africa.

defense spending, two other reasons why demand is off stand out: 1. The industry is beginning to feel the loss of some of its markets occasioned by inadequate supplies in prior years. 2. Many consumers are living off their inventories.

Inventories in 1957 present something of a paradox. Customers with defense orders have steadily reduced stocks. Those firms evidently feel assured of a continuous supply of nickel. But nondefense users have been building up stocks. Probable reason: They have been living on a hand-to-mouth supply and are afraid of getting caught in a pinch again.

Last January, consumer inventories totaled 12,500 tons. But since then they have climbed steadily and now stand at 22,500 tons. Nickel producers believe the build-up has probably reached its peak. They look for sharp inventory cutbacks in 1958 as civilian consumers begin to realize that nickel will be in adequate supply for the foreseeable future.

Pattern — The change in the nickel picture is not temporary. It's unlikely supply and demand will be in balance again for some time. Two main reasons are cited by Mr. Larson: 1. The government can release large amounts of nickel from the DPA inventory to the civilian economy in time of shortage. 2. World-wide production will grow faster than even the most optimistic appraisals of consumption.

Output in 1958 and 1959 will be only slightly higher than this year's. But in 1960-61 a whole new chunk of production comes in. By 1961, Canada will have increased her nickel output by 60,000 tons over 1957, Cuba by 27,500 tons, and the rest of the Free World by 5000 tons. Total Free World production in 1961: 337,500 tons, up 93,500 tons from 1957.

Consumption will rise, too, but not as sharply. Estimates peg U. S. consumption in 1961 at 175,000 tons compared with 125,000 tons in 1957.

Stockpile—An important factor in the future supply-demand balance will be the fate of the U. S. stockpiling program. Two kinds of stockpiles affect nickel: 1. The strategic stockpile for emergency defense needs. 2. The DPA (Defense Production Act) inventory.

Material in the DPA inventory is acquired under contracts designed to stimulate industry expansion (all premium price nickel goes into the DPA inventory). But in early 1957, the government began diverting all nickel slated for the DPA inventory back to industry.

The 1957 diversions amount to 58,500 tons of nickel, half premium price and half market price. All the market price nickel is being sold. Through the first three quarters, most of the premium was disposed of. But in the fourth quarter, supply of market price nickel has become so abundant that buyers refuse to touch the premium (around 7300 tons).

That the government means to continue this practice was pointed up in October when the General Services Administration announced that all nickel slated for shipment to the government in 1958 would be diverted. But look for little premium price nickel to be sold in 1958.

Lineup — Six producers supply (or will supply) most of the nickel the U. S. needs.

International Nickel Co. produces about 60 per cent of the Free World's nickel supply. Production in 1957 was at the rate of 147,500 tons—that will jump to 192,500 tons by 1961 when the company's new mines in northern Manitoba go into production (see STEEL, Oct. 28, p. 124).

Inco's contract with the government calls for delivery of 1000 tons of nickel a month between January, 1954, and December, 1958. Current price under the contract is about $1 (Canadian) a pound.

National Lead Co. operates the government's Nicaro, Cuba, mines, refinery, and smelter through its Nickel Processing Corp. Production currently runs between 2000 and 2150 tons of nickel oxide and nickel oxide sinter a month. About 750 tons monthly goes to the firm's Crum Lynne, Pa., refinery to be converted into metallic nickel. The rest is sold in sinter and oxide form.

National Lead hopes to acquire Nicaro when its lease with the government expires later this month (see STEEL, Dec. 2, p. 59). Says

Charles Rieth, manager of nickel sales for National Lead: "If National Lead obtains this plant, we may very well diversify our line of nickel products."

M. A. Hanna Co., Cleveland, produces ferronickel (45 per cent nickel, 55 per cent iron) at its Riddle, Oreg., facilities under a contract with the government. The contract calls for the U. S. to take Hanna's production through June, 1962, or until 62,500 tons have been produced.

Falconbridge Nickel Mines Ltd., Toronto, Ont., has four contracts with the U. S. government that call for delivery of 87,500 tons of nickel between 1951 and 1962 at about $1 a pound. Company officials estimate production of refined nickel in 1957 at 22,750 tons, production in 1960 at 27,500 tons. Developed and indicated ore reserves total 45,259,450 tons, averaging 1.43 per cent nickel and 0.75 per cent copper.

Sherritt Gordon Mines Ltd., Toronto, has a contract with the U. S. to deliver 25,000 tons of market price nickel over a five-year period ending December, 1959.

This year, the company sold about 5000 tons of nickel to U. S. consumers—the figure should climb to 10,000 tons by 1960. Ore reserves total 13,070,000 tons, averaging 1.108 per cent nickel and 0.580 per cent copper.

Freeport Sulphur Co., New York, will make its debut on the U. S. scene in mid-1959 as a major nickel producer. Ore will be mined at Freeport properties in Moa Bay, Cuba, and shipped to the company's refinery in Port Nickel, La. Production will run 25,000 tons yearly.

Freeport has a contract that commits the government to take up to 135,500 tons of nickel between 1959 and 1965 at 74 cents a pound if the company requests it.

Markets—Where will all this additional nickel go? Producers see the greatest potential in expansion of existing markets (see table below), even though many of these uses, like stainless, are off this year. Mr. Larson pegs these markets as having the best growth potential: 1. Stainless steels for architectural and consumer uses. 2. Plating for industrial applications. 3. Specialty high nickel alloys for applications where increasing temperature and pressure requirements are necessary.

Nickel will lose ground in areas where substitutes were found during the period of shortage. Two examples: Alloy steels and nickel silver.

Competition is tightening. Producers cite gains of aluminum in architecture and autos, titanium in aircraft, and plastics in the chemical industry, all at the expense of nickel.

Technology—Producers are stepping up their research programs to find new uses for nickel. Several recent technological gains will spearhead greater sales. Some examples: 1. Use of special nickel alloys for gas turbines and atomic energy. 2. Use of nickel powder in cadmium batteries. 3. Nickel alloys for high temperature applications. Says Charles Brown, nickel sales manager for Freeport: "One promising area is experiments of the Atomic Energy Commission on a shielding alloy of molybdenum and nickel."

Outlook — Producers admit there's a rough road ahead for nickel, but maintain the long term outlook is bright. They point out that usage has been artificially restrained in the past because of large government takes.

The 1958 picture shapes up like this: First-half shipments will be under the same period of 1957 by about 5 per cent. But demand will begin picking up in June or July as defense users start coming into the market again. The year could eventually wind up a little better than 1957. Look for prices to hold at present levels.

Where Domestic Consumption Goes*

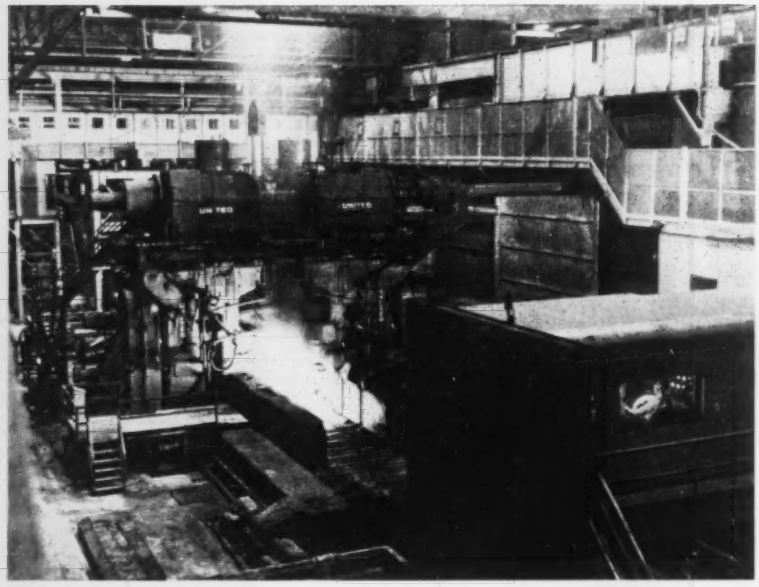
	Breakdown by uses in 1956	
	Tons	Percentage of total
Ferrous:		
Stainless steels	32,883	25.78
Other steels	17,413	13.65
Cast irons	5,819	4.56
Nonferrous	35,840	28.09
High temperature and electrical resistance alloys	11,373	8.92
Electroplating:		
Anodes	15,952	12.50
Solutions	1,074	0.84
Catalysts	2,001	1.57
Ceramics	425	0.33
Magnets	933	0.73
Other	3,865	3.03
Total for 1956	127,578	100%

*Exclusive of purchased and home scrap.
Source: U. S. Bureau of Mines.

IBM To Open Texas Plant

International Business Machines Corp.'s Supplies Div. will begin operations today at its new punch card plant in Sherman, Tex. A nucleus force of 23 employees, now in training at the Greencastle, Ind., card plant, will handle initial operations.

The 56,000 sq-ft facility includes administrative offices (with an IBM machine accounting installation), an employees' cafeteria, parking, and warehouse space.



Largest project in Republic's expansion is this 45-in. slabbing mill in Cleveland

Getting Set for the Future

Republic Steel Corp. prepares its Cleveland plant for expanded markets with new coke ovens and heavy slabbing mill, revamped hot-strip mill, six high-production open hearths

EXPANSION of Republic Steel Corp.'s Cleveland plant from 2.57 million to 3.36 million annual ingot tons is virtually completed.

At the time of the announcement, Republic's mills were operating at only 70 per cent of capacity. Although its officials are concerned, the downturn is not without its bright side, says T. F. Patton, Republic's president. "Management can pay more attention to such things as quality, service, and education of salesmen and distributors. The public is demanding something better and different. We're intensifying research because of the downturn and are completing a research center in Cleveland."

Just Around the Corner—"The concept of Republic's management about great prosperity ahead has not changed," he says. "Only, the upturn won't come overnight as it did after the downturns of 1949 and 1954. Inventories are larger than expected; buying by consumers is not up to expectations; and there is plenty of capacity now. A slow upturn is expected by the latter part of 1958."

The added capacity at the Cleveland plant alone (it's the largest part of the 19 per cent expansion of all Republic facilities) is the equivalent of 5 million refrigerators a year, Mr. Patton explains.

Now Making Steel—Among the improved facilities are these:

Two, new 375-ton open hearth furnaces, and the capacities of four have been increased from 275 tons to 375 tons per heat.

A 45-in. universal slabbing mill which can roll 25-ton ingots (STEEL, Nov. 25, p. 100), and 16 new soaking pits.

Revamping of the 98 in., hot strip mill to permit straightaway rolling of slabs up to 75 in. wide.

Three new smokeless coke oven batteries. One is completed, and two are under construction.

J&L Adds New Mill

Jones & Laughlin Steel Corp., in Cleveland Works modernization, installs cold-reducing mill

Jones & Laughlin Steel Corp. is operating a new four-stand cold reducing mill for sheet steel at its Cleveland Works. The mill, described as "one of the industry's fastest," cost $10 million and will produce 70,000 tons of sheets per month. That's about double the capacity of the unit it replaces.

The 4 stand, 4 high, 77 in. mill has a maximum speed of 3800 fpm and can produce sheet 72 in. wide. A new blooming mill and reversing rougher for the hot strip mill will supply coils in weights up to 18,000 lb for the new facility. The ten electric motors that drive the mill provide 23,000 hp. It was designed and built by E. W. Bliss Co., Salem, Ohio, and erected by Ragnar-Benson Inc., Pittsburgh.

Features—Each motor has a separate generator to reduce and simplify the drive mechanisms by eliminating pinion stands and cutting down the size of the reduction gearing.

An x-ray gage on the delivery end of the fourth stand controls motor speed and the thickness of sheets. Heat from the mill rolls is dissipated by recirculating 2500 gallons of oil and water emulsion per minute. A total of 5000 gallons of water per minute cools this emulsion, the mill lubricants, and the ventilating air for the electrical equipment. Water is cooled in a forced draft tower.

Suppliers—All piping and facilities for handling lubricants, coolants, oil, air, and steam were installed by Blaw-Knox Co., Pittsburgh. General Electric Co. supplied electric drive equipment, which was installed by Dingle-Clark Co., Cleveland.

Wheeling Steel Expands

Wheeling Steel Corp.'s $4.5 million improvement and modernization program at the Benwood, W. Va., works is underway.

Major pipe finishing, pipe warehousing, and shipping operations

are being consolidated. The pipe warehouse building is being expanded and converted to a finishing department. A warehouse is under construction. Major railroad track changes, to service the new areas, are near completion.

Forging Outlook

Backlogs have been slipping for 18 months, so tonnage volume may drop 25 to 30 per cent in '58

THE DOLLAR volume of forging shipments has climbed steadily the last three years. But shipments have slipped tonnagewise, Charles H. Smith Jr., president, Steel Improvement & Forge Co., Cleveland, told the Drop Forging Association at New York.

Up in Ten Years—Over the last ten years, dollar volume of shipments has increased 220 per cent, compared with an all-industry average of 150 per cent, Mr. Smith said. He cited three reasons: 1. The cost of forgings has gone up. 2. Drop forgers are working with more expensive metals (like titanium, aluminum, and high-priced alloys). 3. Customers are demanding more intricate (hence costlier) forgings.

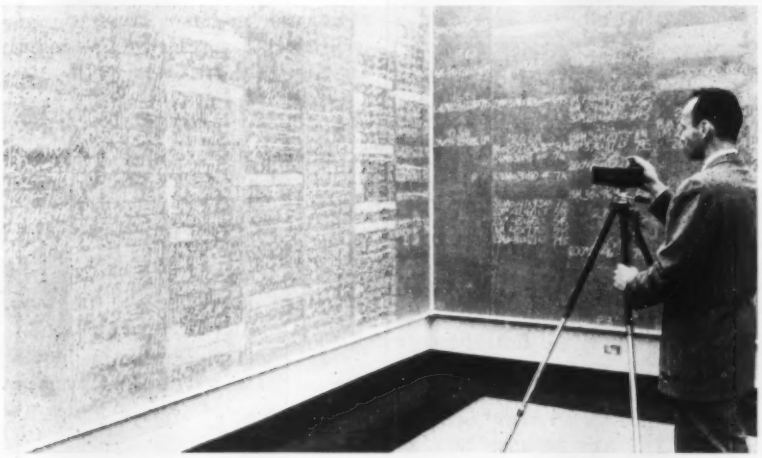
On the darker side, new orders have steadily declined, especially during the last 18 months. Backlogs (in dollars) have been going down, too, even though the situation is still a little better than it was in 1955.

Up, Down in '57—Industry people told STEEL that the reduction of inventories continued this year and that most customers have just about used up their stocks. The industry expects a rise in dollor volume, a slight dip in profits, and a slump in tonnage shipments this year.

Estimates on 1957 shipments range from 15 to 40 per cent under 1956's when the job shops delivered 700 million tons (add 300 millions tons for captive shops). Firms supplying the aircraft industry seem to be hardest hit. Employment throughout the industry is off 25 to 35 per cent.

Off in '58—The outlook for 1958 is not too bright—some forgers predict a dropoff from 1957 of 25 to 30 per cent. The picture will be pretty dependent on the automobile and farm machinery business. The missile field holds promise. Several of the new missiles use forgings in fuel tank heads, rocket nozzles, and accumulator tank caps.

Remedies—How can the slump in sales be overcome? Mr. Smith outlined a four-step program for future improvement: 1. Do a more constructive job of merchandising and advertising. 2. Embark on a program of product improvement. 3. Determine plant modernization requirements and the type equipment that will be needed for tomorrow's economy. 4. Ask metal producers to develop special steels and alloys to meet demands of tomorrow's customers.



Getting the Inventory Picture

Rolled Steel Corp. gives its sales representatives a clear picture of the complete steel inventory carried by its main Skokie, Ill., warehouse. The job is done with photographs of this chalkboard on which a running inventory is kept. Sets of pictures covering the 122-ft board are taken every Friday. They're in the hands of salesmen in the field by Monday morning

Executive Pay Rises

Average manager's salary went up 5.1% in '56, vs. 5.9% in '55, says AMA

THE AVERAGE pay of 35,000 high ranking executives in 3800 U. S. and Canadian companies went up 5.1 per cent from 1956 to early 1957. By comparison, the average was 5.9 per cent in 1955 to early 1956, says the American Management Association in its survey of top management compensation.

Dean H. Rosensteel, director of AMA's Executive Compensation Service, points out that the overall average does not reflect variations in individual firms, their size, complexity of operations, sales, and profits.

Small Firms' Pay—Of 716 small companies analyzed (annual sales up to $10 million), executive salaries varied in direct relation to size, product, and market. The variety in salaries in larger companies was more related to industry classifications.

Pay and Profits — Economic trends in industries resulted in varied compensation practices. Durable goods manufacturing companies had a sales increase of 5.4 per cent in 1956 vs. 1955. Net profits decreased 6 per cent, and executive salaries gained 3.1 per cent.

In the nondurable goods industry, sales were up 7 per cent in 1956 over 1955, and net profits rose 10.1 per cent. Executive compensation climbed 6.2 per cent.

More than 70 per cent of the reporting companies contributed to some form of retirement for 74 per cent of the executives.

Of the entire group surveyed, 49 per cent received pay increases, 41 per cent received the same pay as they did in 1955, and 10 per cent received pay cuts in 1956.

Get Grievances Settled Quicker

1. **Spell out the foreman's authority and specific areas in which he can make grievance decisions.**
2. **Conduct foreman training sessions on handling grievances. Try role playing to give him practice.**
3. **Keep a record of all grievances. Analyze them, trying to spot possible contract changes which will eliminate similar problems in future.**
4. **Keep foremen and shop stewards informed of all grievances and settlements made by company as they occur.**
5. **Keep your labor contract language clear.**
6. **Don't be afraid to go to arbitration when necessary.**
7. **Remember—you can't win them all!**

How To Cut Grievances

SCORE YOUR grievance handling record "average to good" if:

1. Your ratio of written grievances is less than 1 per 20 employees per year.

2. Less than half of your grievances go beyond the superintendent-chief steward stage for settlement.

3. Less than 5 per cent of the grievances end up in arbitration.

That's the consensus of a dozen industrial relations executives contacted by STEEL. Each is emphatic: The real test is the first—how many grievances are settled before reaching the writing stage.

Grievance Causes—The key to cutting grievance costs is your foreman. That's because he's almost always involved in several common grievance-generating areas.

- Seniority in both layoff and recall situations: Problems arise over employee ability. A foreman may feel the individual with the most seniority is not qualified to handle the job that's open.
- Discipline: Even with well-defined rules and penalties, problems will arise: Is the individual wrongly accused? Are there "special circumstances" to consider?
- Distribution of overtime and job assignments when incentive rates are involved: The ability factor enters these decisions, too.
- Job classifications in problems relating to wage differentials for various types of work being done on similar equipment.

The Five Steps—Step No. 1 in most grievance procedures requires the employee to take his problem to his foreman or immediate superior. The shop steward may also be called in. Particularly in the first three areas listed above does the foreman's skill in human relations and knowledge of your contract determine whether grievances are settled here or progress up the ladder toward arbitration.

The higher the grievance goes, the costlier it becomes. Step No. 2 usually involves reducing the grievance to writing and setting up meetings among the individual involved, the foreman, superintendent, and two or three union representatives. Step No. 3 takes the grievance to the industrial relations department—and adds a couple more management and union representatives. Step No. 4 brings the issue to top management and the union's international representatives. The last step, arbitration, will tie up five management men for at least a half day or more.

Crucial Step No. 1—Best bet to get more settlements at Step No. 1 is foreman training (STEEL, Oct. 14, p. 76)—most companies with good grievance handling records devote up to 25 per cent of their foreman programs to the topic. Typical programs include:

1. Periodic discussion (led by the industrial relations department) of all grievances which reach the written stage.

2. Role playing. Hypothetical cases are developed, and foremen act out the situation as if they were on the firing line.

3. Before contract negotiations, foremen are asked to submit sug-

gestions for improving the contract to reduce grievance frequency.

4. Following contract settlement, foreman sessions are held to inform them of the contract's contents.

Records Help—Keep a record of all written grievances and their settlement. Make sure that reports of these go to foremen and shop stewards. One midwest supplier of auto parts with four plants—all under the same union—found its officials were being whipsawed by the union because grievance records weren't kept.

Officials in one plant would "compromise in one situation because of special circumstances." When the same issue, but without the "special circumstances," occurred in another plant, the union demanded the same treatment.

It took the firm two years to gain consistency in its settlements. Fewer special circumstances were allowed. Results: The number of grievances was cut in half. The number going beyond the superintendent level (step No. 3) dropped from 90 to 50 per cent of the total.

Steward's Role—Most industrial relations directors agree: Permit shop stewards to exercise their responsibilities under the labor contract. A steward well versed in contractual intent and informed of grievance settlements is an asset in keeping written grievances to a minimum.

Safety Valve—Don't look upon the grievance machinery as a "necessary evil." Employees should have some method for appealing a supervisor's decision.

One unorganized plant doesn't believe in ever reducing a grievance to writing. If the foreman and employee can't reach agreement, then the superintendent is brought in, and so on up the line to the president if necessary. The objective is quick settlement. Says the industrial relations manager: "By zeroing in fast, keeping the issue on a verbal basis, you will provide a better atmosphere for compromise and settlement."

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.*

Capital Spending Hits Peak, Starts To Ebb

(Millions of dollars)

	1955	1956	1957		1958
			12 mo.†	Oct.-Dec.†	Jan.-Mar.†
All Durable Goods Industries	5436	7623	8047	2173	1665
Primary iron & steel	863	1268	1705	489	357
Primary nonferrous	214	412	847	260	182
Electrical machinery	436	603	606	183	124
Machinery (except electrical)	809	1078	1242	347	308
Motor vehicles & equipment	1128	1689	1121	258	193
Other transportation equipment	274	440	566	160	119
All Nondurable Goods Industries	6003	7331	8002	2178	1760
Mining	957	1241	1254	313	279
Railroads	923	1231	1391	329	306
Public utilities	4309	4895	6278	1843	1413
Communications	1983	2684	10,262	2452	2306
Commercial & other	7488	8364			
Totals*	28,701	35,081	37,034	9805	8165

Sources: Department of Commerce, Securities & Exchange Commission.
*Includes groups not shown. †Estimated.

Spending Starts Downturn

AFTER setting a record in 1957, new plant and equipment expenditures will start sliding off. Spending in the first quarter of '58 will drop to an annual rate of $35.5 billion (seasonally adjusted)—5 per cent below the quarterly average of '57. That's the indication of a survey by the Commerce Department and Securities & Exchange Commission.

The survey shows that capital spending will exceed $37 billion in 1957—6 per cent above the record established in 1956. All divisions, except commercial and railroads, will hit new highs.

A Record—Total outlays hit a record annual rate (seasonally adjusted) of $37.75 billion in '57's third quarter and will approximate $37.5 billion in the fourth quarter. The annual rate in the first half was $37 billion.

Manufacturers will spend over $16 billion in 1957 to set a record for the tenth consecutive year. But they're not expected to repeat that performance in 1958. They started dropping off in '57's last quarter and report a much greater drop (see table) in the first quarter of '58.

Pressure Pipe Needs High

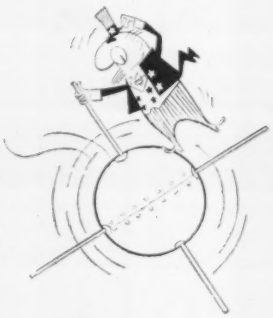
About 2.5 billion ft of pressure pipe will be required by water supply and sewage disposal works for new construction, maintenance, and repair during the 1957-75 period. An additional 661 million ft will be needed for gas distribution.

The Department of Commerce made the estimates in a study of pressure pipe requirements. You can get a copy from any Commerce Department field office for 10 cents.

Furniture Maker Adds

Dixie Dinettes Inc., Richmond, Va., will add about 18,000 sq ft to its 40,000 sq-ft plant. Cost: $50,000.

Who Can Direct Space Program?



IN 6 TO 12 months, we can convert our Atlas ICBM to launch a satellite weighing at least 500 lb, perhaps "several thousand," reports J. R. Dempsey, director of the Atlas program for Convair Div., General Dynamics Corp.

We are spending closer to $10 million than $100 million a year on our antimissile programs (the Army's Nike-Zeus and the Air Force's Wizard), guesses Peter Schenk, marketing manager, technical military planning operation, General Electric Co.

There is the "determination" within government circles to begin a big space program, but the "organization" to do the job does not exist, says Dr. Arthur Kantrowitz, nose cone scientist and vice president, Avco Mfg. Co.

Satellites, antimissile missiles, a space program: Why are we still in the talking stage more than ten weeks after the sputniks? The answer is dangerously simple: We have no one in Washington willing to take responsibility for moves that could decide the fate of the nation.

McElroy Is Boxed in

The five walls of the Pentagon have effectively blocked any solid action by our new defense secretary, Neil McElroy. Several weeks ago (STEEL, Nov. 25, p. 59), he revealed a plan to establish a single manager for satellites not included in the International Geophysical Year, antimissile missiles, missiles not yet developed, and new "upstream" space weapons. Rather than the "single manager" system outlined, it now appears that this project will be a "co-ordinating" agency placed on top of the present Defense Department missile office and the various projects of the three services. In other words, none of the present offices will lose any of their present conflicting powers to the new agency.

Looking at Washington today, one wonders how we ever agreed upon a Manhattan Project in World War II. The situation is so snarled that the Air Force last week went ahead with its own new office for space projects (a "Directorate of Aeronautics") until Air Force Secretary James Douglas was forced by Congressional pressure to "temporarily" suspend the order.

Maybe Nixon Could Take Hold

President Eisenhower is doing little to help the situation. His appointment of Dr. James Killian as science czar has been meaningless: The man has no authority. William Holaday's new title, director of guided missiles, gives him no budget authority (which is the only kind of authority that counts in government circles).

Look for a Congressional move in January to give Vice President Nixon the job of directing our space program. He has been on top of the situation much more than any other administration figure, many congressmen think, and he has the rank necessary to control the Pentagon (if he uses it). The vice president has clearly stated on several occasions that "we can spend all the money we need to for adequate defense." That has gone over well with Democratic and Republican leaders alike, in the face of continued talk from the President and the Bureau of the Budget for economy at the Pentagon.

No one denies the need for economy there; but we must create a real space program soon or economy will become meaningless. Dr. Kantrowitz thinks the Russians will put a man in space in less than three years; he thinks we can do it in less than five—if we spend the necessary money.

How Much Will Space Cost Us?

Dr. Werner von Braun, technical director of the Army Ballistic Missile Agency, thinks a "national space agency" with an annual budget of $1.5 billion can get us into space in five years. George Sutton, chief of preliminary design, Rocketdyne Div., North American Aviation Inc., and president of the American Rocket Society, believes we could have a program for $100 million that will be good enough to do the job in the first year—if the agency were allowed use of present service facilities.

Either way it's done, the dominant feeling on Capitol Hill is that it has to be done, whatever the price.

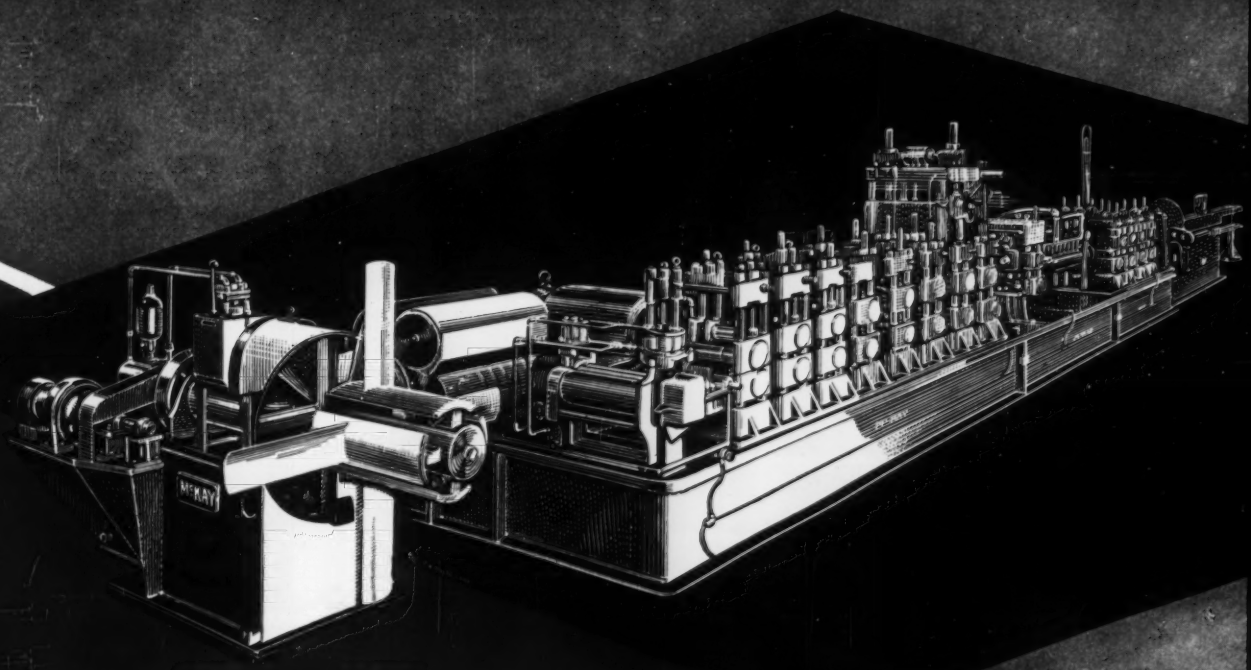
One conversation in Capitol corridors these days: "The Russians did us a tremendous favor when they launched the two sputniks because they alerted us to their rapid progress in space. Are we now going to wait for another alert (the 15-minute variety given by a nuclear warhead) before we decide that something ought to be done?"

The reply is: "But, Mr. Congressman, no one in the White House has told the Pentagon to decide that an immediate decision is needed."

Aircraft Revival Next Year

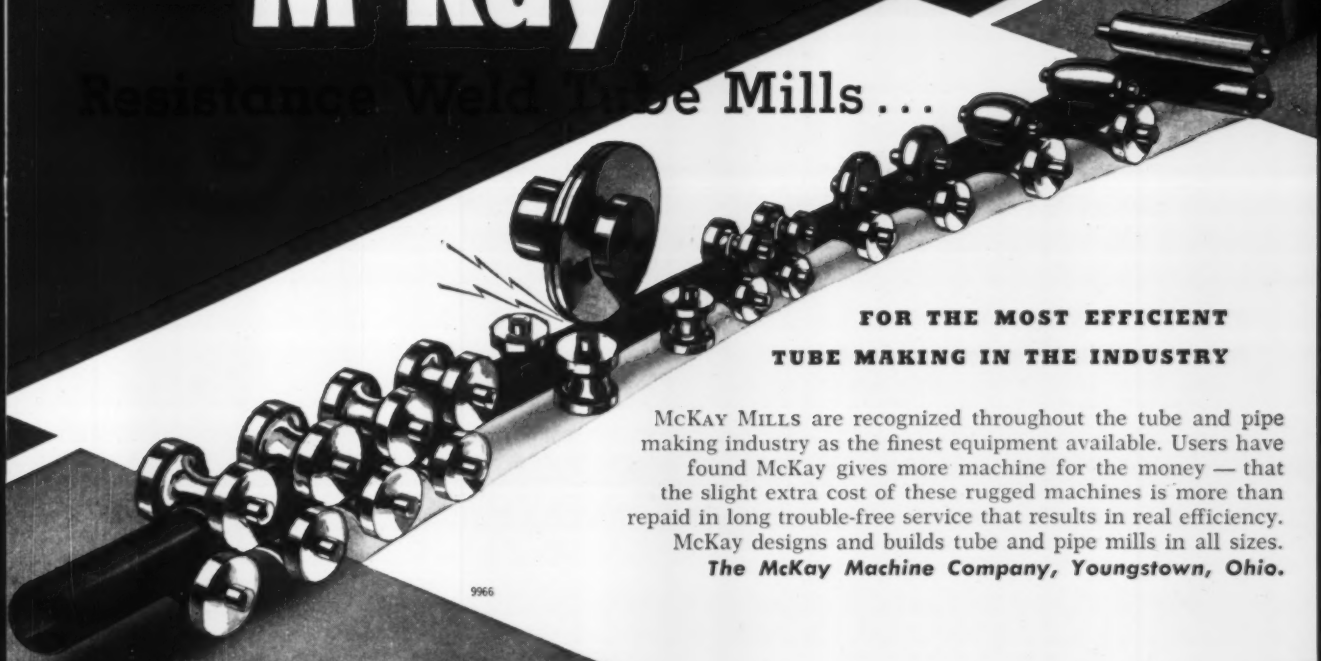
With missile production far slower than hoped, the Strategic Air Command is describing itself as a joint missile-bomber force. The new chemical bomber (WS-110A) will be phased into SAC by 1960, as IRBMs and ICBMs come in, too. The AF is also pumping for more B-52s.

It looks like the downturn in aircraft production has about hit its low point, Washington sources agree. They are looking for a big hike in military sales in the last quarter of 1958.



McKay

Resistance Weld Tube Mills . . .



FOR THE MOST EFFICIENT
TUBE MAKING IN THE INDUSTRY

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The McKay Machine Company, Youngstown, Ohio.

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SETTING THE STANDARDS OF QUALITY IN METAL WORKING MACHINES FOR TWO GENERATIONS

Got a deep drawing problem?

Perhaps you need dies with the wear resistance of **CRUCIBLE'S HYCC TOOL STEEL.** Ask your Crucible warehouse staff—they have **HYCC** in stock.

Crucible HYCC is an air or oil hardening tool steel with high resistance to wear. That's why both heat treaters and production men prefer this high chromium, high carbon tool steel for deep drawing steel dies as well as for blanking dies and punches for long production runs. It's also suitable for high production forming operations.

Crucible HYCC is one of dozens of tool steel grades stocked at the Crucible warehouse near you. This plant is Crucible-owned and -operated . . . to give you all the advantages of direct "mill" service with your steel selection and fabrication problems. Crucible is the only specialty steel producer *fully integrated to the point of use.* That means control and responsibility from raw material to warehouse delivery to you.

STOCKS MAINTAINED OF:
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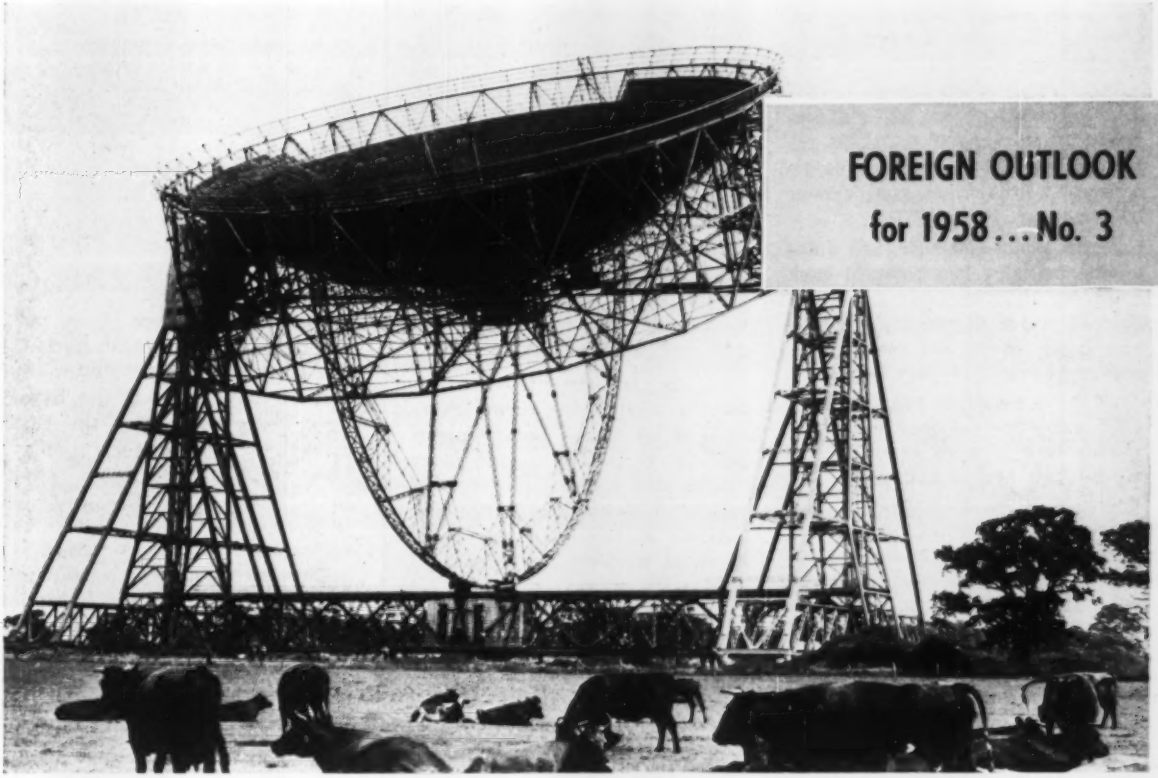
FOREIGN OUTLOOK for 1958... No. 3



This steel saucer is the antenna for the world's largest radio telescope at Jodrell Bank, England

UK Is Optimistic

Fuel shortage, strikes, and inflation find the metalworking industry still going strong. Steel and pig iron production rise; auto exports boom; shipbuilders happy

ENGLAND goes into 1958 with many hopeful signs.

The steel industry still shows strength despite four months of gasoline and fuel oil rationing, widespread strikes, and rising inflation which caused the Bank of England to up its interest rate to 7 per cent as a countermeasure.

Uncertainties — Unions continue to threaten strikes for higher wages despite warnings from the government that further inflation may throw the country into a financial crisis. Credit limitations are raising questions about the availability of investment capital for the planned expansion of steel capacity to 32.4 million tons by 1962. Current annual capacity is 26.6 million tons.

Unemployment is spreading in South Wales due to the closing of obsolete tin plate mills and to decreased demand brought about by rising prices.

Certainties—The steel industry will produce close to 24 million tons in 1957, against 23 million tons in 1956. Pig iron production will hit 16.4 million tons this year, a gain of 1.4 million tons over 1956 output. (This increase is particularly impressive since it was accomplished with fewer furnaces. Only 98 were operating this year, compared with 100 in 1956.)

Domestic prices went up 6 per cent in December, 1956, and another 7.5 per cent in July, this year. However, the home market took all of most products offered.

Despite rising prices, English steel exports for '57 rose 21.6 per cent over 1956's. Imports of steel will be about 1 million tons this year, down a half million tons from 1956. Increased facilities are expected to reduce this to less than 500,000 tons in 1958.

Still Behind—However, demand in most products is still running ahead of supply. The government has decided to continue suspension of import duties on a wide range of iron and steel products until Sept. 18, 1958.

Heavy plates are in short supply, though producers have increased capacity. One shipbuilder expects to buy 5600 tons of heavy plates from the U. S. during the next two years.

Shipyards Busy — Shipbuilders have orders covering several years. At the end of the third quarter, orders were on hand for 848 ves-

sels, comprising 7.6 million tons. (About 1.5 million tons are produced a year.)

Total value of all vessels on order is estimated at $2.7 billion. About 20 per cent of the ships are for export; 54 per cent will be tankers. Production was slowed by strikes early in 1957.

Autos Boom—The English automobile industry has bounced back from its 1956 recession. Autos shipped out of the country in 1957 accounted for 16 per cent of the country's total export earnings. This is a gain of 41 per cent over 1956 exports. An estimated $7 million worth have come to the U. S., two and a half times the value of 1956 shipments to the U. S.

So many orders are booked for the future that an extra ship will enter the North American trade in 1958 to insure prompt car deliveries.

The increased auto production was partially accomplished by automated equipment, since the 50,000 people who left the industry in 1956 have not all returned.

Construction — Some construction cutbacks are expected due to the tight money situation, but the exceptional activity in 1957, seasonally reduced now, will continue into 1958. Pressure for delivery of steel to present construction sites remains high.

Twelve years after the end of World War II, much of the destruction remains in many cities and towns. In London, Birmingham, and other places, whole blocks of office buildings are under construction on the bombed-out sites.

While new contracts for these jobs have slowed, steel needed to complete the projects will keep production high for several months.

The British Transport Commission, which controls the railroads, is committed to a multimillion-dollar program of expansion and conversion from steam to diesel and electric locomotives.

Even the few independent manufacturers of railroad rolling stock in England have long bookings for exports to the Commonwealth countries.

Power Expands—Need for electric power has increased to such an extent that 51 new power stations have been built since the industry was nationalized in 1948. Producers of electrical equipment have also done a thriving export business.

General Electric Co. of England plans to double its annual production of $280 million at one of its Midland factories. This plant produces diesel-electric and electric railroad equipment and will provide much of that used for the electrified railroad between London and Manchester.

U. S. Investments — Another hopeful sign is the rising interest of U. S. industry. According to a British Board of Trade source "there are hundreds of arrangements" between U. S. firms and English companies. Five major types of working agreements:

1. A U. S. subsidiary company in the U. K. with capital control remaining in American hands.

2. Joint ownership of a firm in the U. K. by British and U. S. interests.

3. A licensing agreement, under which a British firm manufactures a U. S. product and pays royalties to the American company.

4. A U. S. firm exports its finished product through a British agency.

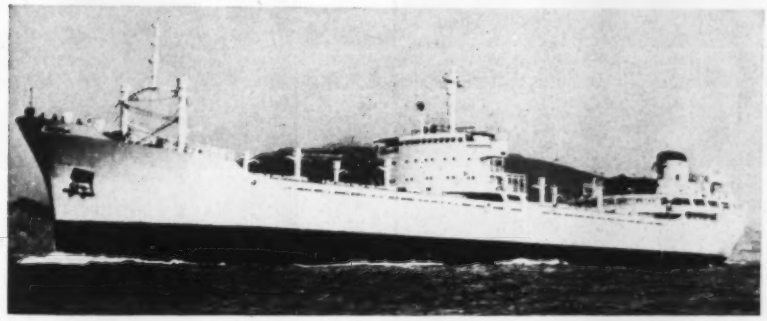
5. A U. S. and British firm exchange technical information on processes and manufacturing.

Future—Two big elements in the future development of British trade with the U. S. are: 1. Inflation. 2. The European Common Market (STEEL, Apr. 8, p. 69). Continued inflation will likely be met by stricter credit measures and reduced imports. If the British Free Trade Area joins the Euromarket, it will mean eventually a joint tariff against U. S. goods. U. S. firms operating inside the U. K. or Euromarket will be in better position on import duties.

The entire English metalworking industry (with the exception of tin plate) is operating at a high rate. Backlog of orders for autos and ships, the need for new construction, the nuclear power program, and the railroad expansion, are likely to keep this rate high at least well into 1958.

Belgium Erects Metallic "Atomium" for World Fair

This gigantic structure, 334 ft high, weighing 2240 tons, will greet visitors to the 1958 Brussels International Trade Exposition. It's designed as a symbol for the atomic age



Here's the first of a new fleet to haul U. S. coal to Italian Finsider steel mills

Italian Steel Faces Tests

Young industry will expand production as loss of protective tariff looms and world demand softens. More autos and other items are exported in 1957

THE STEEL industry of Italy, grown strong on the world-wide demand for steel the last few years, faces two major tests for 1958.

First: Loss of a 5 per cent protective tariff against steel from other members of the European Coal & Steel Community in February (unless current Italian efforts to get it extended for another year are successful).

Second: A possible softening of world demand for steel, bringing more vigorous competition (at home and abroad) from the powerful steel industries of Germany, England, Belgium, and Luxembourg.

Hopeful—Italy, traditionally an importer of steel, last year became an exporter. In 1956, steel exports reached 757,291 tons, against 656,223 tons imported, for an export balance of 101,067 tons. Total production in 1956 was 6.5 million tons of steel ingots. Production in 1957 is expected to be a little more than 7.5 million tons. Target for 1960 is an annual production of 11.2 million tons.

Imports of steel products in 1957 increased 29 per cent over 1956, but exports rose 27 per cent, for an export balance of 115,232 tons. Pig iron production is expected to reach 2.4 million tons this year, but plans to eliminate this bottleneck in steel production call for expansion of facilities to produce nearly twice this amount by 1960.

More Plant—The Fiat-Mirafiori company, automaker, and the Falck company, plan two new blast furnaces and a steelworks at Vado, near Genoa. The project will cost an estimated $126 million, and the furnaces will have a combined capacity of 1 million tons. Capacity of the steelworks will be 784,000 tons.

The government-controlled Finsider group, large producers of steel, have plans to expand existing plants. These plans may have to be abandoned, however, in face of political pressure for a new integrated steel plant to be erected in southern Italy. Cost of the projected plant is estimated at $280 million, while Finsider's expansion plans would cost one fifth as much.

Automobile production will be near 350,000 units this year, a gain of 14.2 per cent over 1956. Exports, which reached 87,000 units last year, will approximate 120,000 vehicles for 1957.

Outlook—Italy's gross national product increase for 1957 will be close to 5 per cent. Wholesale prices dropped 1.2 per cent while the cost of living index rose 1.6 per cent (U. S. consumer price index rose 2.7 per cent).

Despite a slight decline in foreign investments, Italian monetary reserves have continued to climb. Observers believe this trend will go on unless the government upsets it with some ambitious program (like the proposed integrated steel plant).

The country's industrial production index (1953 equals 100) has averaged 137 in 1957, a gain of 8.6 per cent over 1956. Unemployment is down slightly.

All Industry—All Italian manufacturing has contributed to the production improvement. Metalworking showed a gain of 13.1 per cent over last year. The leather and shoe industry produced 17.9 per cent more; paper production rose 14.2 per cent; and textiles went up 13.8 per cent.

Impact of the forthcoming six-nation Common Market (made up of the members of ECSC) will likely cause some readjustments initially. However, the long pull indicates that the Italian economy, though struggling in some sectors, is firmly on its feet.

Canada Protests

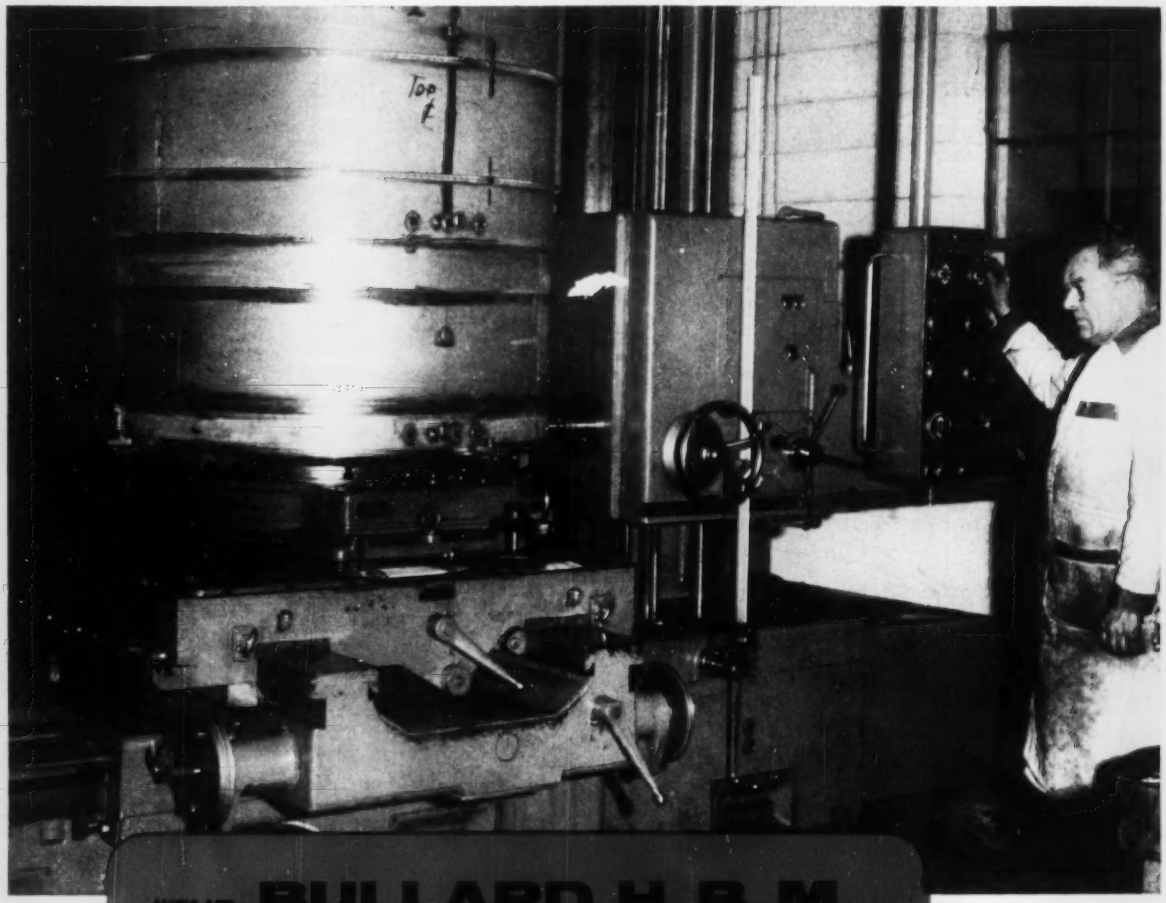
The suggestion that Canada import sheets and tin plate to relieve the situation in South Wales (see story on Page 45) brought sharp protests from Hamilton, Ont., steel manufacturers.

V. W. Scully, president, Steel Co. of Canada, expressed surprise that the Canadian trade delegation visiting Wales would make such a proposal.

"In tin plate, and sheets generally, the Canadian mills have equipped themselves to meet the Canadian market situation," said Mr. Scully.

"At the present time, we have more than adequate capacity, and we cannot see how our economic position is going to be helped if it is going to become more difficult to employ that capacity," he added.

Gordon Churchill, Canadian minister of trade and commerce, and head of the 50-man trade delegation, said in Cardiff, Wales, that Canada is a definite market for British steel, including tin plate.



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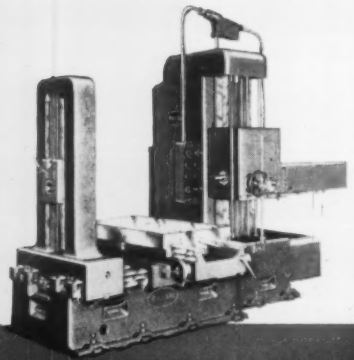

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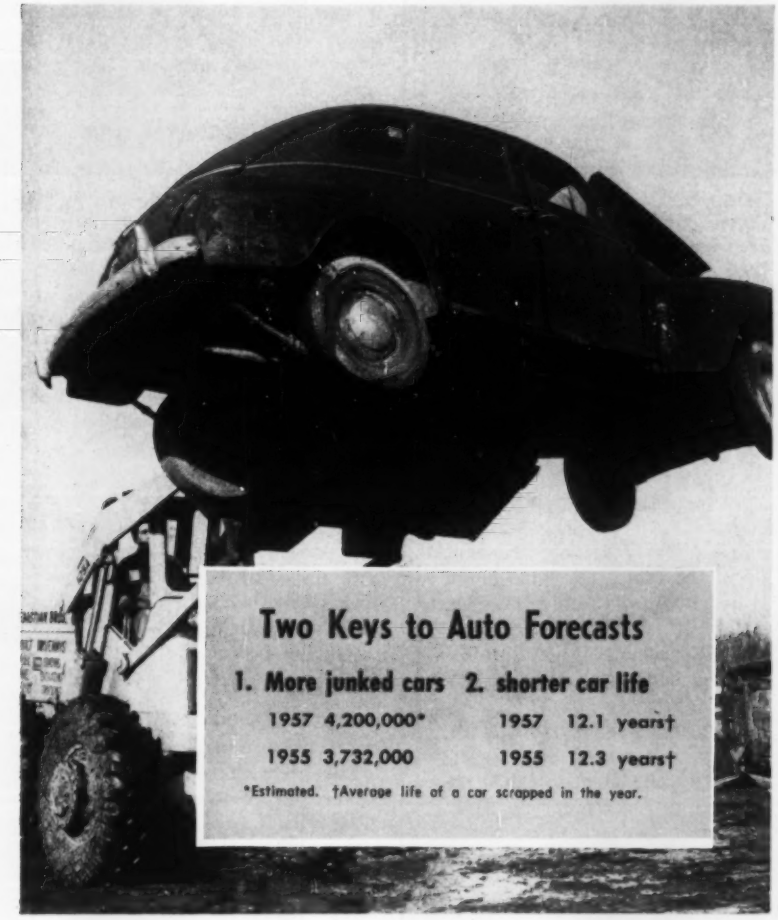
Two Keys to Auto Forecasts
1. More junked cars
1957 4,200,000*
1955 3,732,000
2. shorter car life
1957 12.1 years†
1955 12.3 years†
*Estimated. †Average life of a car scrapped in the year.

How auto scrap rates and age are used in . . .

Figuring Market Potential

PRESIDENTS of auto companies are perusing sales and production forecasts at more frequent intervals. Reason: Predictions haven't been panning out.

In December, 1956, the industry generally agreed with Harlow Curtice, General Motors president, that the 1957 market would absorb about 6.5 million passenger cars and 900,000 trucks. By May, Mr. Curtice had to revise his car estimate to 5.8 million sales.

Earliest predictions this fall were for 6.5 million car sales in 1958, but the industry has already dropped back to a 6-million forecast. It hopes it won't have to prune this estimate.

How Come?—When forecasting, automakers seldom are victims of their own sales enthusiasm. But like other economists, those in Detroit can make mistakes in estimating the changes ahead for the general economy. In addition, the auto industry has its own difficult-to-use forecasting tools.

Let's take a look at some of the problems of estimating car scrappage (which is only a part of market forecasting).

Basic — Chrysler Corp. explains that the growth rate in number of cars in service is compared with increases in the number of cars needed by a growing population, more family formations, more persons entering the age group of first-car buyers, and other market factors.

Growth rate (difference between number of cars scrapped and number of new registrations) is one of the measurements auto companies use to determine market potential.

Scrap Rate—Scrappage increases when cars are junked at an earlier age. The Automobile Manufacturers Association points out the average age of vehicles being scrapped is getting shorter as the percentage of World War II cars diminishes.

But nobody will know exactly how much car life shortened this year until late in 1958. Forecasters have to base car age estimates on old figures.

Life Shrinks — Latest available figures (1955) show the average vehicle (including cars and trucks) was junked when it was 12.3 years old. Some persons believe average life now is around 12.1 years.

Some analysts say one reason for shorter life is that the number of cars with complicated mechanisms like automatic transmissions has skyrocketed in recent years.

Cheaper To Scrap—If a six-year-old car develops automatic transmission trouble today, it may be cheaper to scrap it than make the repair.

It's hard to find out how many cars with automatic transmissions are being scrapped each year. Statisticians are just beginning to dig deeply into such figures. They weren't needed seven or eight years ago when automatic shifts were on less than 25 per cent of the cars

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Low Cost Fuel Injector Reported

A high pressure, metered fuel injection system that can be built for $40 or less has been developed by Sabre Research Corp., Daytona Beach, Fla. Injectors in use cost $105 to $180 to manufacture. Their complicated parts often make for operational failure.

In an exclusive interview, Thomas H. Thompson, Sabre's president, gave STEEL some of the details of his system. It already has created some interest in automotive circles.

Metering—It consists of a centralized metering unit. Impulses are transferred to each injector by a closed circuit hydraulic system.

Nozzles—Fuel is injected through special nozzles which contain a simple mechanical device that determines the dwell period between each shot of fuel into a cylinder. Fuel is kept under constant pressure in each nozzle.

The device differs from the more expensive electronic metering unit used in the Bendix fuel injectors available on Chrysler cars.

Pump—Although the Sabre system will work with any fuel pump, Mr. Thompson reports his company has developed its own mechanical pump which is submerged in the fuel tank. The pump is driven by the engine through a closed hydraulic circuit similar to the one used on the metering device.

Key—This injection system is made possible by a durable metallic bellows developed by Sabre. The bellows is used in the metering system and fuel pump.

Each bellows is a series of small spring washers which are sealed and joined (by Neoprene O-rings instead of brazing or soldering) to increase the longevity of the unit. Mechanical loads are carried by a metal O-ring surrounding the Neoprene seal, relieving the sealing ring and the washer.

Mr. Thompson points out that larger bellows could be used in air suspension units and hydraulic brake systems.

on the road. Now about 80 per cent of cars in service have them.

Create Demand—Scrapping not only helps to determine the growth rate of cars in service, but each car scrapped presumably means another must be bought to replace it.

To see how this phase of scrappage fits into the market forecast picture, STEEL talked with George P. Hitchings, manager of Ford Motor Co.'s Economic Analysis Dept.

Big Picture — "The turnover of existing cars is the heart of the new car market," says Mr. Hitchings. More than 85 per cent of new car sales involve the trade or sale of a car. Between 85 and 90 per cent of these trade-ins are less than six years old.

"Only a small proportion is scrapped," Mr. Hitchings adds. In 1956, only slightly more than 700,000 cars in the zero to six-year age group were scrapped.

"Scrappage occurs largely in old cars which are traded for newer used cars. In 1956, there were nearly 2 million cars in the seven to ten year age group which were scrapped and 1.3 million in the still older (prewar) category," he says.

"The previous owners of these cars provided a secondary market for the newer used cars traded for new cars. To this extent, scrappage has an important indirect impact on new car sales," concludes Mr. Hitchings.

Small Cog—To the uncertainties surrounding scrappage estimates, add the problems of determining used-car fluctuations, national economic trends, and recent changes in car buyers' use of long term credit. It's amazing that analysts come as close as they do.

Buys Casting Machine

Detroit Gasket & Mfg. Co., Detroit, is installing a semicontinuous casting machine. It is capable of producing as many as 12 aluminum extrusion alloy billets simultaneously in lengths up to 16 ft. It is being furnished with mold equipment to produce billets of 5⅛ in., 6 in., and 8 in. diameters. Supplementary equipment includes a high-speed circular saw capable of cutting through 6063 alloy billets of 8 in. diameter in as little as 3 seconds. The equipment is being manufactured by Lobeck Casting Processes Inc.'s plant in Alburtis, Pa., and will be installed at Detroit Gasket's Extruded Metals Div. in Belding, Mich.

Exhaust Note

• Chrysler's 300-D luxury sports car is powered by a 380-hp engine —390 hp with fuel injection. The advertised delivered price runs from $5108 to $5538 for hardtop and convertible models.

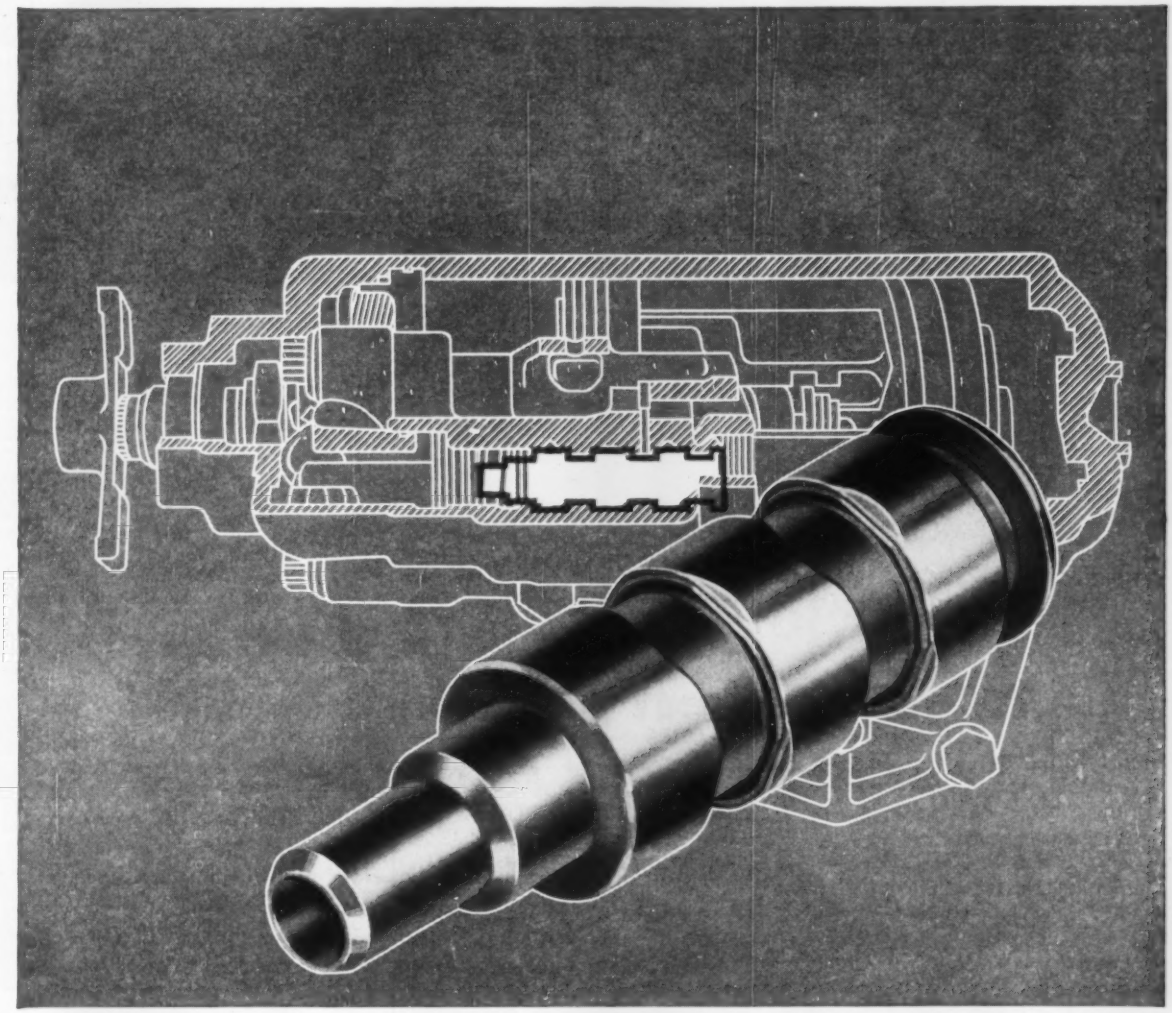
U. S. Auto Output

Passenger Only

	1957	1956
January	642,089	612,078
February	571,098	555,596
March	578,826	575,260
April	549,239	547,619
May	531,365	471,675
June	500,271	430,373
July	495,629	448,876
August	524,354	402,575
September	274,265	190,716
October	327,362	389,079
November	578,601	580,803
11 Mo. Total	5,573,099	5,204,650
December		597,226
Total		5,802,808

Week Ended	1957	1956
Nov. 9	136,742	132,087
Nov. 16	141,902	135,641
Nov. 23	151,846	118,949
Nov. 30	114,795	159,976
Dec. 7	139,506	167,576
Dec. 14	145,162†	158,431
Dec. 21	146,000*	154,832

Source: *Ward's Automotive Reports.*
†Preliminary. *Estimated by STEEL.



LEDLOY* JUMPS VALVE SPOOL CAPACITY 138 TO 240 PIECES PER HOUR

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And the manufacturer goes on to say, "the quality of finished pieces went from poor to very good."

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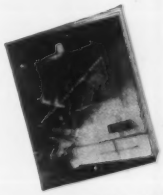

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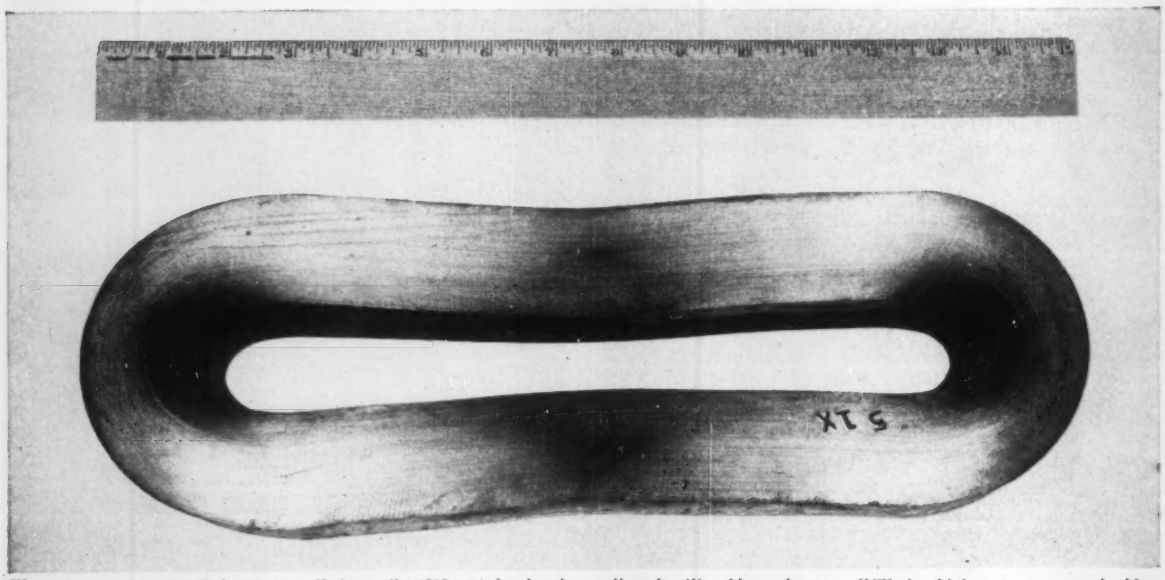

Flattening test of 10½" O.D. by 1.580" wall of 18-8 Cb (AISI 347) showing the excellent ductility of large, heavy-wall Timken high temperature steel tubing.

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DM-2	2¼% Cr.-1% Mo.	Sicromo 7	25-20
Silmo	Sicromo 3	Sicromo 9M	25-12
DM	4-6% Cr.-Mo.	18-8 Stainless	
2% Cr.-Mo.	4-6% Cr.-Mo.-Ti	18-8 Cb	

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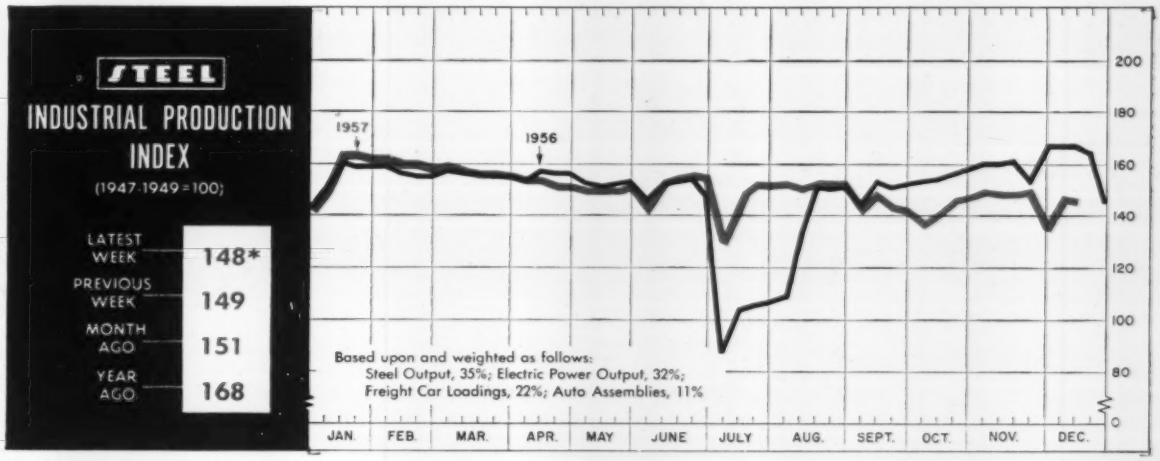

*Week ended Dec. 14.

Unemployment Under 5% of Labor Force

RISING UNEMPLOYMENT, falling total employment figures, and shorter workweeks are gaining the national spotlight.

But the glare hides the fact that this nation still has virtually full employment, a factor which will do as much as anything to prevent the business dip of 1957-58 from going too far. It will be a strong influence in the upturn during next year's second half.

Short Memory—Many people in business today have never lived through periods of full-blown unemployment, and the memories of their older associates have been dulled by what one economist calls the "hyper-full employment of recent years." In November, unemployment rose by 700,000 (admittedly a disturbing figure) to about 3.2 million. That's about 4.7 per cent of the civilian labor force, and it's a lot of Americans out of work.

But it tends to overshadow the fact that 64.9 million other Americans are still working—most of them at a full workweek and at generally higher hourly wages. Total employment today exceeds the figure for a period as recent as April, 1955.

Comparisons — Another important (and often overlooked) fact is that at least part of the latest decline in employment is seasonal. Last year, the dropoff of 905,000 (or 1.4 per cent) between October and November was not viewed with alarm because the general economy was in its most prosperous period in history. This year, the decline was only a little more—1,132,000, or 1.7 per cent—but it has raised many fears of a depression because there are some soft spots in the economy.

As far as the general economy is concerned, unemployment is still no major problem, although it could be if trends continue. Economists on the Economic Forum of the National Industrial Conference Board do not feel that the total

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	1,739[1]	1,770	2,525
Electric Power Distributed (million kw-hr)	12,400[1]	12,315	12,200
Bituminous Coal Output (1000 tons)	9,075[1]	8,090	10,640
Petroleum Production (daily avg—1000 bbl)	6,820[1]	6,850	7,355
Construction Volume (*ENR*—millions)	$226.5	$201.0	$528.1
Auto, Truck Output, U. S., Canada (*Ward's*)	174,593[1]	167,761	195,168
TRADE			
Freight Car Loadings (1000 cars)	600[1]	618	717
Business Failures (Dun & Bradstreet)	287	235	270
Currency in Circulation (millions)[3]	$31,827	$31,666	$31,660
Dept. Store Sales (changes from year ago)[5]	−5%	−20%	−3%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$21,660	$22,099	$21,887
Federal Gross Debt (billions)	$274.7	$274.8	$276.2
Bond Volume, NYSE (millions)	$30.0	$28.5	$33.3
Stocks Sales, NYSE (thousands of shares)	11,847	11,077	11,811
Loans and Investments (billions)[4]	$86.9	$86.1	$86.2
U. S. Govt. Obligations Held (billions)[4]	$25.6	$25.0	$25.8
PRICES			
STEEL's Finished Steel Price Index[5]	239.15	239.15	225.92
STEEL's Nonferrous Metal Price Index[6]	206.5	206.5	253.2
All Commodities[7]	118.0	117.9	116.2
Commodities Other Than Farm & Foods[7]	125.7	125.7	124.6

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1957, 2,559,490; 1956, 2,461,893. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

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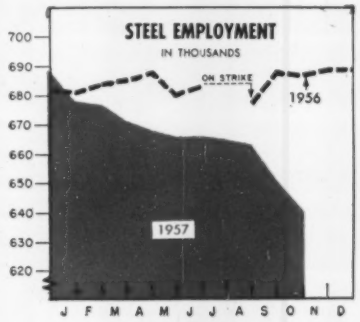
THE BUSINESS TREND



	Employment in Thousands		Payroll in Millions	
	1957	1956	1957	1956
Jan.	678	681	$360.4	$329.1
Feb.	677	684	327.5	317.3
Mar.	671	685	344.2	338.1
Apr.	668	688	331.5	326.7
May	666	680	338.0	333.6
June	666	683	324.8	332.4
July	665	n.a.	334.6	n.a.
Aug.	663	677	343.7	309.9
Sept.	651	688	330.1	339.0
Oct.	640	687	345.6	358.9
Nov.	...	689	....	346.0
Dec.	...	689	....	347.2

n.a.=not available because of strike.
American Iron & Steel Institute.
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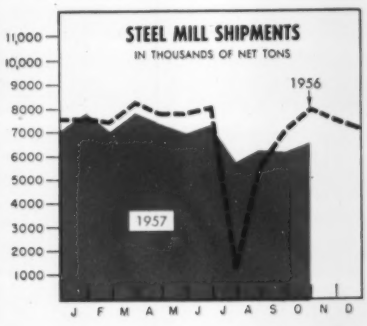


	Net Tons		
	1957	1956	1955
Jan.	7,809,451	7,587,870	6,009,958
Feb.	7,066,732	7,468,393	6,119,900
Mar.	7,821,616	8,255,824	7,268,795
Apr.	7,349,752	7,783,873	7,279,321
May	6,972,091	7,764,776	7,540,889
June	7,284,616	8,077,805	7,770,213
July	5,877,133	1,288,988	6,250,597
Aug.	6,229,853	5,539,915	7,053,615
Sept.	6,171,674	7,058,028	7,378,247
Oct.	6,550,690	7,930,957	7,216,821
Nov.	....	7,431,136	7,247,994
Dec.	....	7,064,093	7,580,943

American Iron & Steel Institute.

will go much beyond an average of 3.6 million during the first half of 1958, with a decline to a 3.4 million average during the second half.

At that rate, unemployment would still be only about 5 per cent of the projected labor force. That would be small in both numbers and percentage of working force, compared with unemployment prior to World War II. (In 1940, unemployment averaged 8.1 million a month, or 14.6 per cent of the working force.)

Bearing the Brunt—Disturbing to the metalworking industry is the large part it has played in the most recent drop in total employment. The five leading segments (primary metals, fabricated metal products, machinery, electrical machinery, and transportation equipment) dropped nearly 57,000 from their ranks from October to November, despite a strong seasonal uptrend in the automotive industry.

Some recent examples: Spang-Chalfant Div. of National Supply Co., laid off 470 at Ambridge, Pa., on Dec. 9; Thompson Products Inc., 1000 in November; Cleveland-Cliffs Iron Co., 175 in Michigan mining areas last week; Timken Roller Bearing Co., 550 since mid-November—and it plans to lay off 250 more in January.

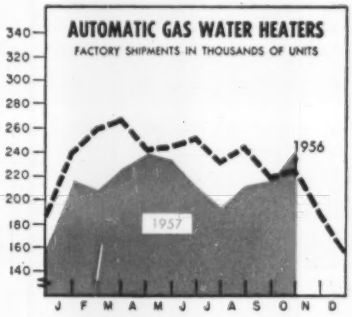
The steel industry alone employed 9000 less in October than in September (see chart above), and the trend has continued through November and December.

Pay Is Up — But hourly wage scales continue to climb. The steel industry's payroll is still at near-record levels (see table above). Average hourly earnings in manufacturing industries reached an all-time high of $2.10 last month. Every category except three (furniture; stone, clay, and glass products; and paper) either stayed at the October level or advanced.

The high wage rate, coupled with higher earning power resulting from a slowdown in inflation, is prompting many businessmen and economists to predict that the recession will be one of the mildest on record.

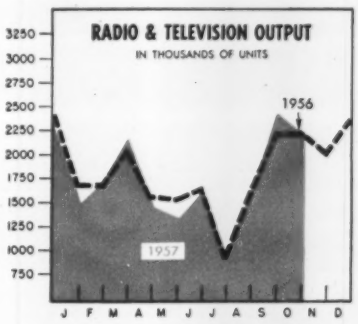
Appliance Men Optimistic

Manufacturers of laundry appliances are anticipating that enough buying power will be unleashed in 1958 to give them their third best year in history. This year will be fourth best, says the American



	Shipments—Units 1957	1956	1955
Jan.	214,900	239,000	210,900
Feb.	208,200	259,200	228,400
Mar.	226,600	267,500	263,100
Apr.	238,200	241,200	245,200
May	233,400	244,300	229,400
June	211,700	251,500	227,100
July	192,500	231,900	219,300
Aug.	210,300	243,500	275,600
Sept.	215,600	218,100	237,100
Oct.	240,900*	224,700	231,200
Nov.	.....	184,400	195,500
Dec.	.....	156,800	185,400
Totals	.....	2,762,100	2,748,200

*Preliminary.
Gas Appliance Mfrs. Assn.



	Radio 1957	1956	Television 1957	1956
Jan.	1,086	1,079	450	588
Feb.	1,265	1,094	465	576
Mar.	1,609	1,360	560	680
Apr.	1,116	993	361	550
May	1,024	1,060	342	468
June	1,088	1,073	544	553
July	613	567	360	337
Aug.	966	991	674	613
Sept.	1,611	1,319	833	894
Oct.	1,569	1,349	662	821
Nov.	....	1,382	...	680
Dec.	....	1,715	...	627
Totals	....	13,982	...	7,387

Electronic Industries Association.

Home Laundry Manufacturers' Association.

Automatic washer sales will total 2.9 million, compared with 2.8 million for this year. Automatic dryers will equal or slightly exceed the 1956 record of 1.5 million, compared with this year's 1.31 million. Automatic ironers will continue their downtrend from 46,000 units this year to 45,000 units in 1958. Washer-dryers, the industry's newest growth product, will jump from this year's 180,000 units to better than 250,000 next year.

Electronics: No Slowdown

One of the fastest growing industries—electronics—shows no signs of slowing down in the near future. The Electronic Industries Association declares that industry sales rose "from $5.9 billion to more than $7 billion this year, and another increase of 8 to 10 per cent is expected next year."

Speaking before the annual forecast session of the U. S. Chamber of Commerce, James D. Secrest, executive vice president of the Electronic Association, said that military sales led the increase this year, and that greater emphasis on missile output and a higher defense budget are certain to boost the total again next year.

Industrial sales, which rose from $950 million in 1956 to $1.3 billion this year, will increase again in 1958. Even sales of TV receivers, which have been off this year, will rise in 1958. Higher radio, phonograph, and high fidelity equipment sales will round out the rosy picture next year.

Trends Fore and Aft

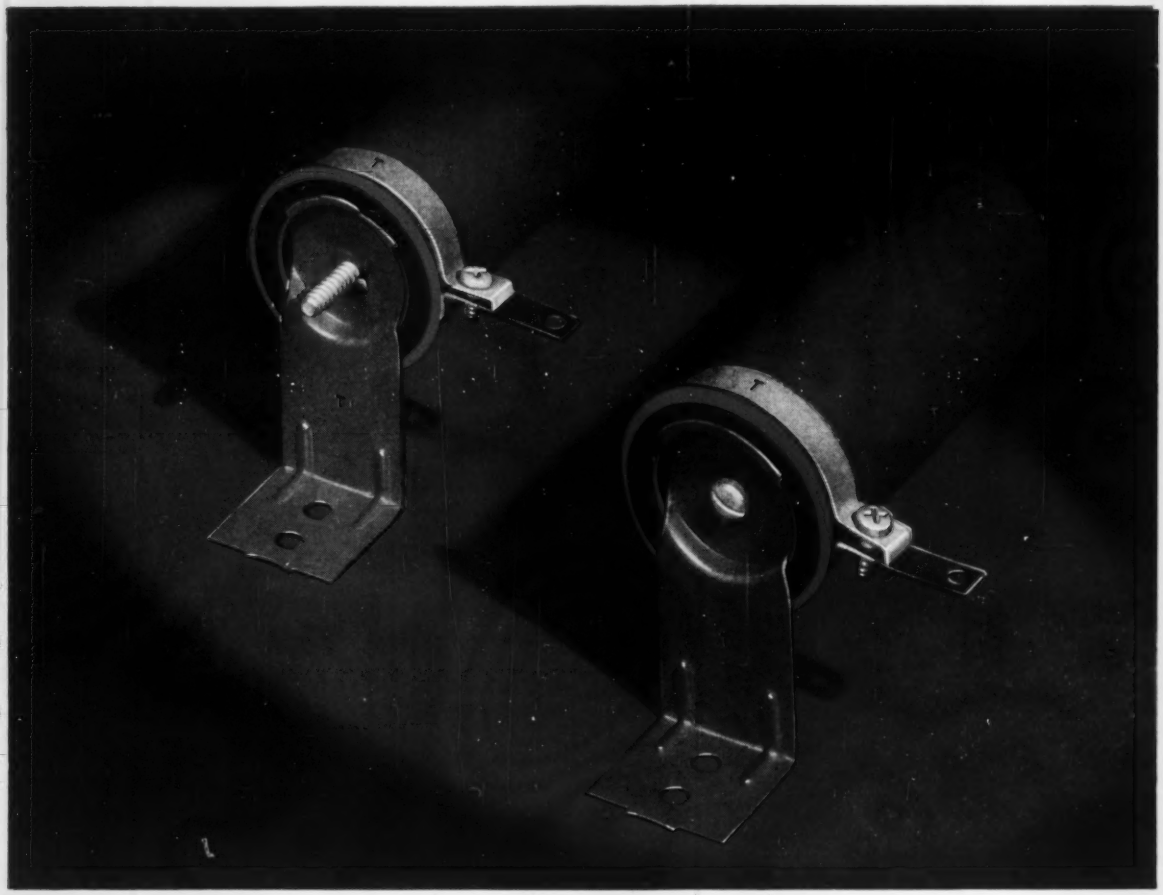
- The government's wholesale price index continued its uptrend in November, reaching 118 (1947-49=100). Weekly figures indicate the December level has backed off a bit.
- The October bookings index of the Material Handling Institute Inc. continued to recover from the August low point with a reading of 124.8 (1954=100). Industry leaders look for the first half of 1958 to hold at the level of 1957's last half, with a pickup following in the second half.
- New orders for foundry equipment improved in October. The index of the Foundry Equipment Manufacturers Association moved up from 113.9 in September to 145.3 in October (1947-49=100).

Coming Jan. 6 IN STEEL

1958 The Year of the Marketeer

We have enough capacity in virtually every metalworking area. The problem now is to keep our plants busy. That's why the emphasis is switching to marketing. STEEL's annual issue will detail some of the ways a new marketing approach can help you manage for profit in 1958.

Some of the other features in the special issue: Results of a survey of 7500 executives on what metalworking management expects in 1958; 48 pages of useful facts and figures; the annual forum on technical progress.



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4 SPEED NUTS® eliminate 8 parts in resistor assembly, cut costs 50%!

Tremendous assembly savings are often possible when Tinnerman SPEED NUTS are "designed into" new products. This is an example: Corning Glass Works, Corning, New York, adopted 4 special SPEED NUT brand fasteners and cut assembly costs on new power-type glass resistors by 50%!

Assembling power resistors is normally a slow and complex operation. Yet a pair of one-piece, spring-steel SPEED NUT angle brackets eliminated 4 of the 9 parts required by another fastening method and cut assembly time to a few seconds!

These corrosion-resistant, vibration-proof fasteners hold the resistor under live spring tension to avoid mechanical shock. Locating washers, lock washers and nuts are eliminated. Also, one-piece SPEED CLAMPS® that double as terminal bands eliminate 2 lock washers and 2 nuts.

SPEED NUTS permit maximum assembly savings on *new* products, but you can probably make worthwhile savings *right now* on current products.

Over 8000 types available. See your Tinnerman representative or write for Bulletin 333-1.

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CANADA: Dominion Fasteners Ltd., Hamilton, Ontario. GREAT BRITAIN: Simmonds Aerocessories Ltd., Treforest, Wales. FRANCE: Simmonds S. A., 3 rue Salomon de Rothschild, Suresnes (Seine). GERMANY: Mecano-Bundy GmbH, Heidelberg.

PAUL H. DALEY
Heppenstall sales dir.

DON S. CONNOR
Micromatic Hone president

D. A. STROMSOE
heads Southern Pipe & Casing

DAVID EISENDRATH
Cory v. p.-manufacturing

Paul H. Daley was promoted to director of sales, **Heppenstall Co.**, Pittsburgh. He was general manager-operations. **J. O. Phillips** was made assistant manager, forging and die steel sales. He was assistant to the president.

Don S. Connor was elected president and general manager, **Micromatic Hone Corp.**, Detroit. Former executive vice president and general manager, he succeeds **Kirke W. Connor**, founder of the firm, who was made chairman.

James I. Ashley was appointed sales engineer for the press division of **E. W. Bliss Co.**, covering the southern California territory formerly served by **M. F. Strauss**, retired. He has headquarters in Burbank, Calif. Mr. Ashley was sales manager for Kenco Mfg. Co.

William B. Harris was made manager of western commercial sales by **Townsend Co.** He has headquarters at Santa Ana, Calif.

William W. Harger was named chief project manager at **Link Aviation Inc.**, Binghamton, N. Y.

John Stevens, president and chairman of **Marathon Corp.**, Menasha, Wis., which was recently merged with American Can Co., was elected a vice president of Canco. **Roy J. Sund**, former executive vice president of Marathon, was elected vice president and general manager of the newly formed Marathon Div. Both have headquarters in Menasha.

D. A. Stromsoe was elected president and general manager, **Southern Pipe & Casing Co.**, Azusa, Calif., division of U. S. Industries. **R. A. Stumm**, former president, was named chairman and chief executive officer. **D. N. Chamberlain**, vice president-sales, succeeds Mr. Stromsoe as executive vice president.

Norman N. Amrhein was elected president, **Federal Malleable Co.**, West Allis, Wis., to succeed **Carl L. Liebau**, now chairman, a new post. **Felix J. Huwiler**, sales manager, was elected vice president-sales. **Thomas Teetor** was made general superintendent; **Harold T. Hoak**, plant metallurgist; **Herman L. Wintheiser**, supervisor of technical sales.

Pat H. Luckett, sales manager of **Rockwell Mfg. Co.'s** instrument division, Tulsa, Okla., was promoted to assistant product manager-gas products, meter and valve division. He has headquarters in Pittsburgh.

John J. Newsome Jr. was made New York area branch manager for sales and service of **Pettibone Mulliken Corp.'s** line of material handling equipment.

George J. Wist was named purchasing director, **Anchor Post Products Inc.**, Baltimore. He replaces **Frank K. Read**, retired.

D. E. Reichelderfer was elected vice president - finance, **Armco Steel Corp.**, Middletown, Ohio. He continues as controller.

David Eisendrath was made vice president - manufacturing at **Cory Corp.**, Chicago. He formerly headed manufacturing of the Cory and Nicro Divisions. In addition, he now includes the Flavor - Seal, Fresh'nd-Aire and Mitchell manufacturing divisions.

James P. Jennings was made factory manager in the Buffalo Hydraulics Div.'s plant, **Houdaille Industries Inc.** He succeeds **Daniel J. Kennedy**, now assistant general manager of Wales-Strippit, subsidiary in Akron, N. Y.

John J. O'Connor was made manager, production planning for the stainless steel division of **Jones & Laughlin Steel Corp.**, at Warren, Mich. He succeeds **Wayne A. Lee**, resigned.

Robert G. Allen was elected executive vice president, **Bucyrus-Erie Co.**, South Milwaukee, Wis. He joined the firm in July as a vice president, and a month later was made executive assistant to the president and placed in charge of manufacturing. Before joining Bucyrus-Erie, he was president of Pesco Products and Wooster Divisions of Borg-Warner Corp.

O. W. Carpenter was elected executive vice president, **Chain Belt Co.**, Milwaukee. He was vice president in charge of construction machinery and finance. He now is responsible for current operations of the company. New vice presidents are: **W. C. Messinger**, in charge of construction machinery; **E. M. Rhodes**, in charge of industrial

equipment; **G. H. Woodland,** marketing.

Cutler-Hammer Inc. appointed **Thomas J. Manning** manager of its new plant, now under construction at Lincoln, Ill. Since 1953, he has been superintendent of the New York works, operating out of headquarters in Milwaukee.

Ivan Calicoat, former manager of **Dana Corp.'s** aircraft gear plant in Ft. Wayne, Ind., was made manager of technical service at Toledo, Ohio, general headquarters. He is responsible for co-ordination of manufacturing and engineering divisions in matters affecting the quality of Dana products for automotive and transportation industries, and their performance in the field.

William A. Lewis was made production planning manager for **Lamson Corp.,** Syracuse, N. Y.

Joseph S. Pendleton Jr., sales service metallurgist, **Carpenter Steel Co.,** Reading, Pa., was promoted to metallurgist-tool and alloy steels.

Herbert A. Kutscha was made manager-outside sales, reinforcing products, at the Chicago plant of **Joseph T. Ryerson & Son Inc.**

J. J. Witzig Jr. was promoted from sales representative to sales manager-Chicago district mill office for **Detroit Steel Corp.** He succeeds **A. J. Rousseau,** retired. **Joseph R. Ricker** replaces Mr. Witzig as sales representative.

William W. Wotherspoon was appointed services manager, steel division, **Ford Motor Co.,** Dearborn, Mich.

Dr. Gerald M. Rassweiler was made head of **General Motors Corp.'s** physics and instrumentation department, research staff, Warren, Mich. He succeeds **Dr. Edward J. Martin,** retired.

Capac Industries Inc., Capac, Mich., appointed **Arnold M. Varner** plant superintendent of its Michigan plant.

V. J. Lajeunesse was elected president, **Union Metal Mfg. Co.,** Canton, Ohio. He succeeds **C. A. Streb,** now chairman. Mr. Lajeunesse was executive vice president.

W. J. SMETAK HENRY R. HANSON A. H. LONG

executives at Wm. K. Stamets Co.

W. J. Smetak was elected president, treasurer, and general manager, **Wm. K. Stamets Co.,** Pittsburgh, and its subsidiary, Stamets Export Co. **Henry R. Hanson** was elected vice president and general manager, distributor division. **A. H. Long,** chief engineer, was elected vice president-engineering.

A. O. Smith Corp., Milwaukee, elected as vice presidents: **M. E. Morgan,** director of purchases; **W. W. Higgins,** chief engineer; **S. E. Wolkenheim,** director of marketing; **R. F. McGinn,** director of research and development. New operating vice presidents are: **J. H. Brinker,** general manager in charge of Permaglas consumer products, Kankakee, Ill.; and **John S. Randall,** in charge of industrial products.

Archie J. Smith was made west coast representative for **Lake Erie Machinery Corp.** He has offices in Van Nuys, Calif.

Nolan McDonald was named plant manager of **Pheoll Mfg. Co.'s** new press products department in Michigan City, Ind. This plant manufactures impact extrusions of high-strength aluminum alloys, brass, magnesium, copper, steel, and other metals.

Southworth Machine Co., Portland, Maine, elected **Stuart W. Tisdale** president; **George F. Thurber Jr.** and **H. Theodore Hawkes,** vice presidents; **Thomas S. Dyer,** production manager; **Gordon Braun,** shop superintendent.

Jean F. Gschwind was appointed vice president-development and research, a new office at **J. O. Ross Engineering Corp.,** New York. He was vice president-general manager, Ross Midwest Fulton Corp.

Alex A. DeBlander was appointed superintendent of **Jones & Laughlin Steel Corp.'s** new stainless steel sheet and strip mill, now under construction at Canton, Ohio.

Canadian Steel Foundries Ltd., Montreal, Que., appointed **G. L. McMillin** president and general manager, succeeding **A. C. MacDonald,** now vice chairman of the board.

Carl Neisser was made manufacturing manager, systems division, **Beckman Instruments Inc.,** Anaheim, Calif.

Jack Wilson was made general sales manager, **Max Ams Machine Co.,** Bridgeport, Conn.

Laird Anderson was made manager of manufacturing planning and production engineering, **Edsel Div.,** Ford Motor Co., Dearborn, Mich.

Dan Chimenti was made director of manufacturing, **International Harvester Co.,** Chicago. Former general manager, farm tractor division, he is succeeded by **Paul W. Johnson,** who was Louisville works manager.

Milton T. Schimmel was appointed west coast sales engineer for **Conforming Matrix Corp.** He is at Gardena, Calif.

Kenneth C. Edson was made Los Angeles district sales manager, **Kelite Corp.**

Oscar K. Undeberg was named vice

COMPLETE Finishing SYSTEMS

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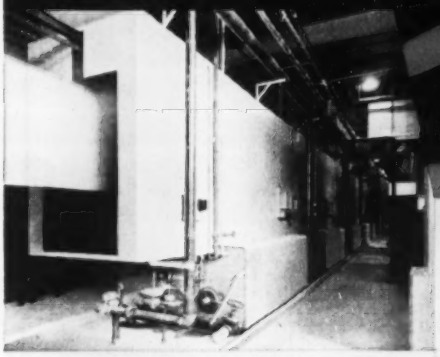
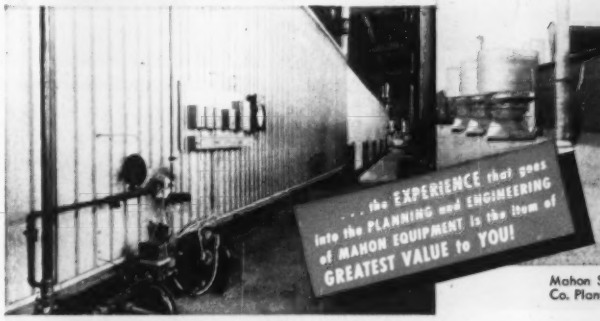
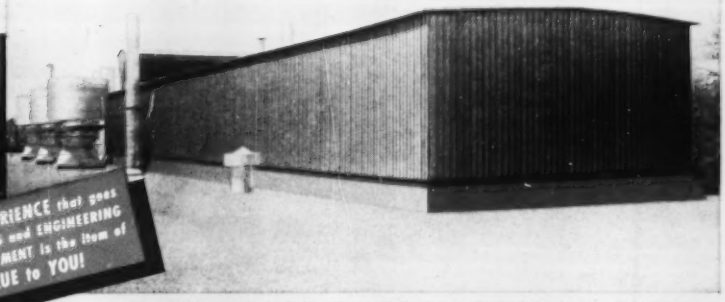


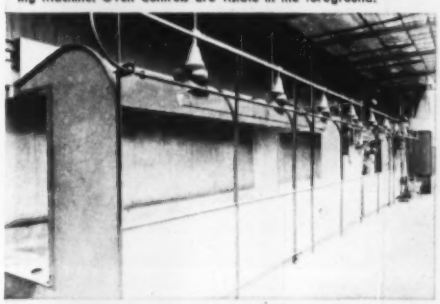
Mahon Five-Stage Metal Cleaning and Rust Proofing Machine—Part of the Complete New Mahon Finishing System at Hussmann.



Mahon Dry-Off Oven at Exit End of Cleaning and Rust Proofing Machine. Oven Controls are visible in the foreground.



Mahon Self-Housed Finish Baking Oven installed on the Roof of the Hussmann Refrigerator Co. Plant. Air Intake, Filtered Air Supply Equipment and Heaters are Housed at the far end.



48 Ft. Mahon Hydro-Filter Spray Booth in foreground. Another 24 Ft. Spray Booth for reverse side painting is visible in the background. Note Filtered Air Diffusers in the Ceiling.

Equipment Room between Finish Baking Oven and Air Supply Room. This room houses Heating Equipment and Controls for both Units.

Mahon Installs THIRD COMPLETE FINISHING SYSTEM in Hussmann Refrigerator Plant!

In addition to several smaller projects, the Mahon Company has installed three Complete Finishing Systems for the Hussmann Refrigerator Co., St. Louis, Mo. The latest one, illustrated here, was designed to paint steel shelving. It consists of a five-stage Metal Cleaning and Rust Proofing Machine, a Dry-Off Oven, two Hydro-Filter Spray Booths, an Air Conditioned Spray Room, and a Finish Baking Oven. The Cleaning and Rust Proofing Equipment, Dry-Off Oven and Spray Room are located inside the plant; the Filtered Air Supply Equipment and the Finish Baking Oven are housed on the roof. This is a typical Mahon Finishing System designed to occupy a minimum of floor space inside the plant, and to do a particular finishing job efficiently and economically. Repeat orders from customers over a period of years is an unquestionable expression of confidence in the Mahon organization, and it is an unspoken tribute to Mahon engineering, and to the quality and operating efficiency of Mahon equipment. If you have a finishing problem, or are contemplating new finishing equipment, you, too, will want to discuss methods, equipment requirements and possible production layouts with Mahon engineers . . . you'll find them better qualified to advise you, and better qualified to do the all-important planning, engineering and coordinating of equipment, which is the key to producing the finest finishes at minimum cost. See Sweet's Plant Engineering File for information, or write for Catalog A-658.

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Engineers and Manufacturers of Complete Finishing Systems—including Metal Cleaning, Pickling, and Rust Proofing Equipment, Hydro-Filter Spray Booths, Dip and Flow Coaters, Filtered Air Supply Systems, Drying and Baking Ovens, Cooling Tunnels, Heat Treating and Quenching Equipment for Aluminum and Magnesium, and other Units of Special Production Equipment.

MAHON

C. RICHARD BAYMAN
joins Herr Equipment

WALTER G. ULLMAN
heads Siegler Heating Co.

THOMAS W. HUNTER
Gary Steel Wks. gen. supt.

president-general manager, **K & M Engineering Corp.**, Downey, Calif.

C. Richard Bayman joined **Herr Equipment Corp.** as sales engineer. He will work out of the home office in Warren, Ohio. Mr. Bayman formerly was chief plant engineer, Brainard Steel Div., Sharon Steel Corp.

Siegler Corp., Anaheim, Calif., established a separate division for its Centralia, Ill., space heating operation, to be known as Siegler Heating Co. **Walter G. Ullman** was appointed president of the new division; **Norman E. Grandt**, first vice president. Both are vice presidents of Siegler Corp. **Ben F. Ostergren** was appointed vice president-sales for the division.

Robert R. Beachler Jr. was appointed director of engineering, **Leach Corp.**, Los Angeles.

Signode Steel Strapping Co. named six regional managers (former district managers). They are: **C. J. Da Costa**, Cleveland; **R. E. Jacobs**, St. Louis; **T. E. Noon**, Boston; **Almer Pearson**, New York; **S. N. Salomon**, Pittsburgh; **J. R. Williams**, Chicago.

Theodore R. Peyrek was elected vice president-sales, **L. J. Wing Mfg. Co.**, division of Aero Supply Mfg. Co. Inc., Linden, N. J. He is assisted by **Adolph W. Hein**. Mr. Peyrek was vice president and manager, heating and ventilation division.

Charles F. Pearson fills the new post of director of marketing for **Spincraft Inc.**, Milwaukee. He was contract sales manager and Canadian sales manager for Ben-Hur Mfg. Co.

Thomas W. Hunter was made general superintendent of **U. S. Steel Corp.'s** Gary, Ind., Steel Works. He was assistant to the vice president-operations of the corporation.

Reynolds Metals Co. appointed **Milton F. Jones** regional manager-packaging sales, south central region, with headquarters in St. Louis. He succeeds **John J. Geiss**, transferred to Detroit, Great Lakes region.

Geoffrey J. Letchworth Jr. was elected vice president - secretary, **Barcalo Mfg. Co.**, Buffalo. **Henry W. Senf** was made treasurer. Mr. Letchworth is general manager, tool division, and was formerly secretary-treasurer.

Frank K. Platt, president, Air Engineering Co., Kalamazoo, Mich., has relinquished that post to become central regional manager for all products of **American Air Filter Co. Inc.**, with headquarters in Detroit. He was succeeded at Air Engineering by **L. B. Mason**.

Bernard A. Artz was made Los Angeles district manager, **Fischer & Porter Co.** He is replaced as district manager, Knoxville, Tenn., by **G. Dale Hetrick Jr.**

Donald W. Walker was made Philadelphia district sales manager, **Kaiser Aluminum & Chemical Sales Inc.**, to replace **R. P. Jensen**, now sales manager, foil and container division, Chicago.

Kenneth L. Madden was made manager of **Electronic Welding's** Burbank, Calif., plant.

Arthur P. Moss was made works manager, **Union Carbide Chemicals Co.**, division of Union Carbide Corp., New York.

L. E. Long was made manager of the San Francisco electrical sales branch of **Wagner Electric Corp.**

Joseph W. Duba was made assistant manager, Cincinnati sales branch, **Crucible Steel Co. of America.**

Daniel M. Pierce was made general manager, **Seaboard Structural Steel**, Wilmington, Del.

William H. Oler was made sales manager, engineering division, **Hauck Mfg. Co.**, Brooklyn, N. Y.

James F. Byrne was made director of material, **Norden Laboratories Div.**, White Plains, N. Y., Norden-Ketay Corp.

Arthur G. Whyte Jr. was appointed general sales manager, **Capitol Products Corp.**, Mechanicsburg, Pa. He was director of specialty divisions of United States Plywood Corp. Mr. Whyte replaces **Paul Hill.**

OBITUARIES...

F. Floyd Harter, district manager, **Universal Cyclops Steel Corp.**, died Dec. 11 in Hartford, Conn.

Edwin R. Bartlett, 74, retired president, **Hooker Electrochemical Co.**, Niagara Falls, N. Y., died Dec. 10.

John H. Victor, 75, founder and chairman, **Victor Mfg. & Gasket Co.**, Chicago, died Dec. 8.

James R. Cardwell, chairman, **Cardwell Westinghouse Co.**, Chicago, died Dec. 8.

Edward W. Murphy, manager of the supplies division, **Yawman & Erbe Mfg. Co.**, Rochester, N. Y., died Dec. 4.

Geoffrey Letchworth, 75, an executive of **Pratt & Letchworth Co.**, Buffalo, for many years, died Dec. 7.

William H. Jewell, 64, vice president, **Ingersoll-Rand Co.**, Athens, Pa., and consultant to the general manager, died Dec. 15.

IN CUTLERY, TOO,

Sharonsteel Quality STANDS OUT

• Cutlery manufacturers know well the name SHARON, for in the past five decades SHARON has excelled in the production of steels used in the manufacture of implements for cutting.

From exquisite carving blades to rugged chain saw teeth, razor sharp scalpels, agricultural and earth moving equipment SHARON provides the edge holding and abrasion resistant steels manufacturers can trust.

If you make products that require cutting edges that endure we suggest that you contact the SHARON representative nearest you and take advantage of this vast library of experience.

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SHARON STEEL CORPORATION, SHARON, PENNA.

CHICAGO, CINCINNATI, CLEVELAND, DAYTON, DETROIT, GRAND RAPIDS, INDIANAPOLIS, LOS ANGELES, MILWAUKEE, NEW YORK, PHILADELPHIA, ROCHESTER, SAN FRANCISCO, SHARON, SEATTLE, MONTREAL, TORONTO

New Research Group

Coal producers, users, and equipment suppliers establish major research center in Pittsburgh

THE COAL industry's research facilities are being consolidated. The bituminous coal industry, major coal users, and companies which supply materials and equipment to the industry are establishing a major coal research center in Pittsburgh. It will be operated by the Bituminous Coal Research Inc.

The consolidation will combine the laboratory operated by the coal industry in Columbus, Ohio, the laboratory and administrative headquarters in Pittsburgh, and the organization's fiscal offices in Washington.

Aims — The center's program will include basic research. Its activities will emphasize the development of improved coal utilization methods and equipment. Objectives will encompass preparation, transportation, handling, and storage of coal; its use as electric utility fuel; and more efficient utilization in the production of industrial steam and for space heating.

Investigations will be carried out on subjects related to coke production and the use of coal by the iron and steel and nonferrous metal producing industries. Research will also cover the fields of gasification, chemicals, and other process uses of coal.

Foundry Opens in South

Cornwall Foundry Co. is operating a foundry in Meridian, Miss. The new firm is making gray iron castings for manufacturers of stoves, water heaters, and machinery. R. W. Mellow is president.

Awards Zirconium Contract

Firth Sterling Inc., Pittsburgh, has been awarded a $1.5-million contract by Westinghouse Electric Corp., that city, for the melting of zirconium ingots from sponge and conversion into finished products. About 40,000 lb of zirconium alloy mill products will be produced in the 12-month period which started Nov. 1, 1957. The material will be used primarily for structural parts and fuel element cladding in reactor cores, being developed by Bettis Atomic Power Div. for the Atomic Energy Commission and the Navy. Firth Sterling will double its melting capacity by the first of the year with the addition of new melting facilities.

Speeds Work on Missiles

Expansion of the west coast missiles industry is proceeding rapidly. Douglas Aircraft Co. has disclosed that 33 per cent of its $1-billion order backlog is earmarked for missiles. Its Santa Monica, Calif., plant is starting full-scale production of the Thor IRBM for the Air Force. Lockheed Missiles System Div., Lockheed Aircraft Corp., will build a $3-million development facility at Sunnyville, Calif., for the Navy's Polaris ballistic missile.

Ramo-Wooldridge Corp., Los Angeles, established its Space Technology Laboratories as an autonomous operation division. It is an outgrowth and extension of the former Guided Missile Research Div. Dr. Simon Ramo will devote full time as president of the laboratories. Dr. L. G. Dunn is executive vice president and general manager. Dr. R. F. Mettler is vice president and assistant general manager.

Transformer Unit Moved

With the removal of Eisler Engineering Co.'s transformer manufacturing facilities from Newark, N. J., to its new plant at 16 N. Salem St., Dover, N. J., this division is now operating as a wholly owned subsidiary under the name of Eisler Transformer Co. Inc. Gerald B. Schenkel is vice president of the new corporation.

J&L To Buy Equipment

Jones & Laughlin Steel Corp., Pittsburgh, will spend some $16.3 million for plant and equipment at its new stainless steel sheet and strip mill under construction at Louisville, Ohio. The facilities, to be housed in renovated and new buildings on the site of the old Superior Sheet Steel Co., will have an annual capacity of about 36,000 tons of stainless steel sheets and strip. New equipment will include a high-speed Sendzimir mill for cold rolling, a continuous annealing and pickling line for cold-rolled sheets, a coil preparation line for incoming hot-rolled sheets, a 54-in. temper mill, three side strip and slitting lines, two shear-to-length lines for cutting coils into sheets, and an inspection line for surface checks and recoiling. Other equipment includes polishers, grinders, and material handling units.

Carpenter Steel To Expand

Carpenter Steel Co., Reading, Pa., may invest up to $6.5 million in its recently acquired subsidiary, Carpenter Steel of New England Inc., Bridgeport, Conn. (STEEL, Dec. 2, p. 81). The amount spent will depend on market potential, customer requirements, cost of local services and supplies, and many other factors under study, says Frank R. Palmer, president. The investment will cover additional machinery, including in-process inspection equipment, inventories, and other working capital.

Will Build Bearing Plant

Miniature Precision Bearings Inc., Keene, N. H., is building a $350,000 plant at Lebanon, N. H., for its Split Ballbearing Div. The division makes a line of standard size ball bearings.

NEW OFFICES

Fafnir Bearing Co., New Britain, Conn., is building a $100,000 branch office and warehouse at Milbrae, Calif. Robert H. Gordon is district manager.

PIC Design Corp., East Rockaway, N. Y., established a branch office at 7335 Van Nuys Blvd., Van Nuys, Calif. John R. Smith has been appointed district manager. The firm makes precision instrument parts and components.

International Parts Corp. and its division, Midas Inc., opened a new warehousing, shipping, and office building at 4101 W. 42nd Place, Chicago. Transfer of property from the present three Chicago ad-

dresses will be completed around the first of the year.

CONSOLIDATIONS

L. A. Young Industries of Canada Ltd., Windsor, Ont., purchased **Canadian Automotive Trim Ltd.**, Ajax, Ont., a subsidiary of National Automotive Fibres Inc., Detroit. The new owner is a subsidiary of Young Spring & Wire Corp. (formerly L. A. Young Spring & Wire Corp.), Detroit. The 120,000 sq-ft manufacturing plant will be operated as the Canadian Automotive Trim Div. of L. A. Young Industries.

Peninsular Metal Products Corp., Ferndale, Mich., is purchasing the **George L. Nankervis Co.**, Detroit, manufacturer of automotive and aircraft testing equipment; electroplating and metal finishing equipment; electromechanical devices; and precision flow measuring instruments and related equipment used in the aircraft industry.

Merger negotiations between **Dresser Industries Inc.**, Dallas, and **Gardner-Denver Co.**, Quincy, Ill., have been terminated.

J. S. Thorn Co., Philadelphia, merged with **Fenestra Inc.**, Detroit, and is being operated as the Aluminum Div. of Fenestra.

Merger of **Midland Steel Products Co.** and **J. O. Ross Engineering Corp.**, including its subsidiaries, became effective on Dec. 7. Executive offices of the new firm, Midland-Ross Corp., are in Cleveland.

Texsteam Corp., Houston, purchased **Graham-Lemunyon Corp.**, Los Angeles, producer of plug valves used by the oil production industry. Texsteam is a subsidiary of Vapor Heating Corp., Chicago.

National Distillers & Chemical Corp. purchased Panhandle Eastern Pipe Line Co.'s 40 per cent minority interest in **National Petro-Chemicals Corp.** which thus becomes a wholly owned subsidiary of National Distillers. National Petro-Chem owns a large petrochemicals plant in Tuscola, Ill., and is constructing a second polyethylene plant at Houston.

ASSOCIATIONS

American Institute of Mining, Metallurgical & Petroleum Engineers Inc., New York, elected Dr. Augustus B. Kinzel, Union Carbide Corp., president. Other officers are: President-elect, H. C. Pyle, Monterey Oil Co., Los Angeles; and vice presidents, A. W. Thornton of National Tube Div., U. S. Steel Corp., Pittsburgh, and J. C. Kinnear Jr., of Nevada Mines Div., Kennecott Copper Corp., McGill, Nev. They will be installed Feb. 18.

The **Society of Mining Engineers** of AIME has nominated J. W. Woomer of Pittsburgh as president-elect of SME for 1958. If elected, he will become president in 1959. S. D. Michaelson, Kennecott Copper Corp., will be president in 1958, succeeding Elmer A. Jones, St. Joseph Lead Co.

Electric Overhead Crane Institute Inc., Washington, elected these officers: President, Frank M. Blum, Harnischfeger Corp., Milwaukee; and vice president, Arland R. Walkley, Manning, Maxwell & Moore Inc., Muskegon, Mich. Joe H. Peritz was re-elected executive secretary and treasurer; C. M. Dinkins, general counsel.

Metals Engineering Institute, a division of the American Society for Metals, Cleveland, appointed Lewis W. Berger training supervisor. He is a research metallurgist.

Air Moving & Conditioning Association, Detroit, elected these officers: President, James W. Wilcock, Sturtevant Div., Westinghouse Electric Corp., Boston; secretary-treasurer, J. J. Merrick, John J. Nesbitt Inc., Philadelphia; and vice presidents, R. A. Wasson of Clarage Fan Co., Kalamazoo, Mich.; L. A. Macrow of Carrier Corp., Syracuse, N. Y., and W. H. Rietz of Ilg Electric Ventilating Co., Chicago. Marshall F. Allen has been appointed executive vice president of the association and Robert K. Guy, assistant to that officer.

Arthur Colton has been appointed staff administrator to the National Standards Committee of the **American Society of Tool Engineers**, Detroit. He is responsible for executing policies formulated by the committee and maintaining liaison with the American Standards Association and standards committees of other engineering groups.

Charles F. Smith, National Guard Products Inc., Memphis, Tenn., was elected president of the **Weatherstrip Research Institute**, Riverside, Ill. Other officers are: First vice president, Harry Zegers Jr., Chicago; second vice president, R. P. Rodenbaugh, Memphis; secretary, Richard Erck, Chicago; and treasurer, W. F. Michals, Chicago. L. G. Klee was re-elected executive secretary.

NEW PLANTS

Rockwell Mfg. Co., Pittsburgh, has started limited production in its new 180,000 sq-ft plant at Kearney, Nebr. The $2-million facility turns out Rockwell-Nordstrom lubricated plug valves. W. D. Willes is general manager of the plant.

Lock Seam Tube Inc. acquired a mill in Montgomeryville, Pa., to fabricate lock seam tubing and rolled metal shapes. The plant will use about 5 million lb of steel each year in cold-rolled and galvanized finishes.

Southern Fabricating Co. Inc. opened a steel tubing plant at Sheffield, Ala. All commercial sizes, gages, and shapes are offered. William E. Daily is sales manager.

Firth Sterling Inc., Pittsburgh, formally opened its Los Angeles warehouse. The facility has been in operation for a year. It is equipped to make semistandard and special shapes which were previously manufactured in the East.

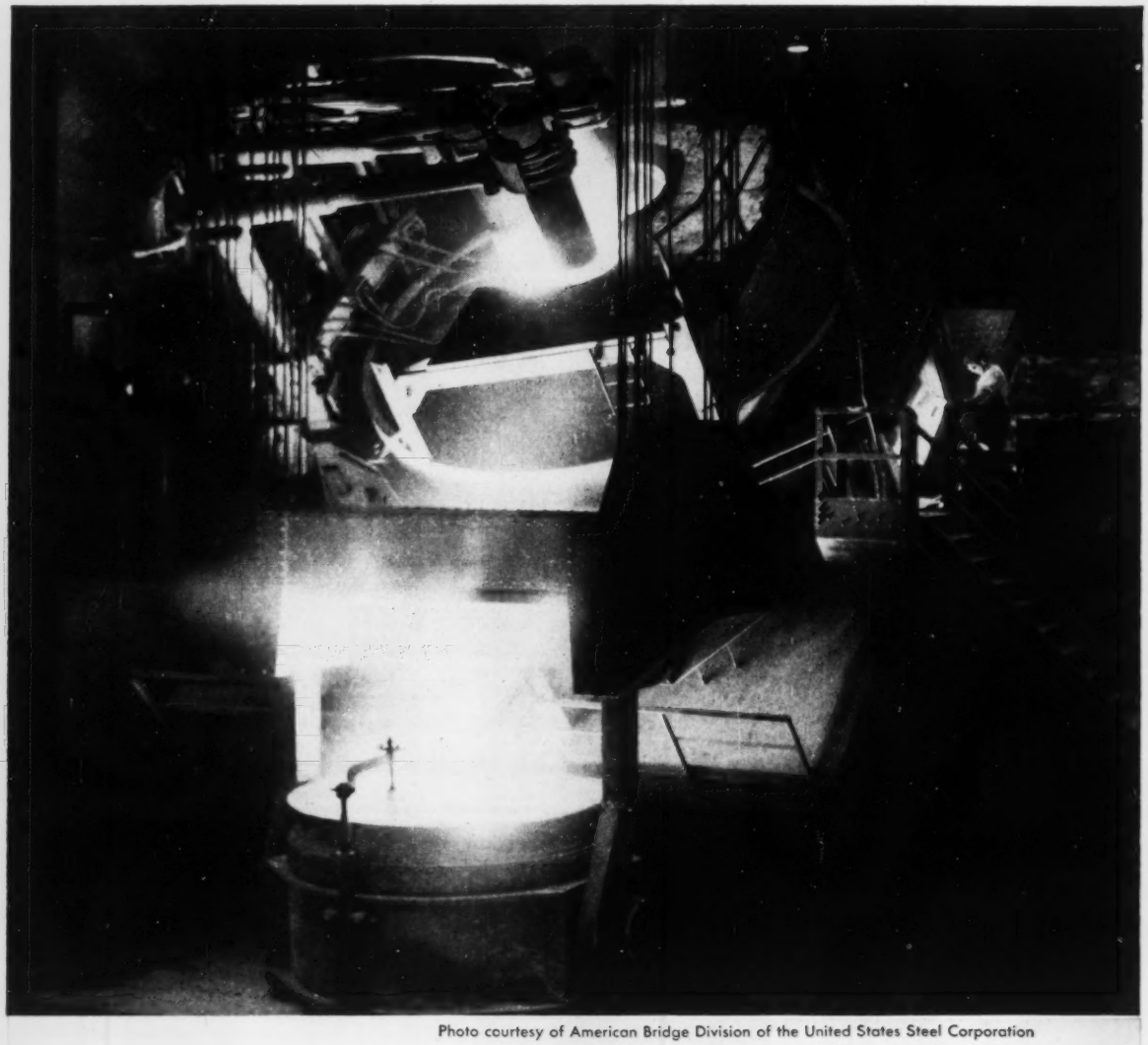

Photo courtesy of American Bridge Division of the United States Steel Corporation

BAKER'S MAGDOLITE AND JEBCOLITE
are always 5 ways better

Continued research and development throughout the years, plus The J. E. Baker Company's precisely controlled manufacturing methods, have resulted in the superior, properly burned, grain-sized Magdolite and Jebcolite particles which help provide:

More uniform ingots—increased ingot production—increased furnace efficiency—lower refractory costs—less defective production material.

Magdolite and Jebcolite* are the *original* dead-burned dolomites that offer better composition, preparation, strength, economy and quality. Don't say "dolomite." Save dollars. Specify Baker's Magdolite for open hearth and Jebcolite for electric furnace use.

**Jebcolite has the same superior chemical, physical and mineralogical characteristics as Magdolite and differs only in grain size which is designed specifically for electric furnace application.*

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PRODUCTS
SINCE 1889

THE J. E. BAKER COMPANY
YORK, PENNSYLVANIA
PLANTS: BILLMEYER, YORK, PENNSYLVANIA — MILLERSVILLE, OHIO

Technical Outlook

BETTER INSPECTION— Dominion Foundries & Steel Ltd., Hamilton, Ont., will soon start using a gamma radiography machine with a capacity of 1000 curies of cobalt 60 (equivalent to a 2 million volt x-ray machine). It will inspect large steel castings—some with sections up to 9 in. thick. Nuclear Systems, a division of Budd Co., Philadelphia, which built the equipment, calls it the largest, commercially built, gamma radiography machine.

COATED ALUMINUM PIPE— New possibilities for aboveground systems are opened up by aluminum pipe coated with a new baked polyurethane coating. It provides excellent resistance to salt water, acids, caustic, oil, and other corrosive agents. Tube-Kote, Houston, is making the product with Kaiser Aluminum pipe.

GIANT STRETCH— Convair, San Diego, Calif., is using a new radial draw former to bend 40-ft aluminum H-sections into belt frames for its jet transport, the 880. The largest ever made by Cyril Bath, Solon, Ohio, the machine has a 150-in. worktable, a 75-ton tension ram, and a 35-ton wiper.

BETTER DIECASTINGS— Work on a new facility for fundamental research on the diecasting process will be started by Alcoa in January at its Chicago works. It will be equipped for full scale pilot plant operations.

NEW BEARING ALLOY— It contains about 20 per cent tin, the remainder is aluminum hardened with 1 to 3 per cent copper. The tin has a structure which is continuous without disturbing the continuity of the aluminum matrix (termed reticular). If there is metal-to-metal contact between the shaft and bearing, there is an immediate supply of tin available at the surface to provide a thin soft layer over the aluminum and prevent surface breakdown. When supplied as steel backed bearings, the new alloy "provides a better balance between the opposing demands of high fatigue strength and low rates of wear than any other plain bearings," reports the Tin Research Institute (England). It has been working on the development for several years.

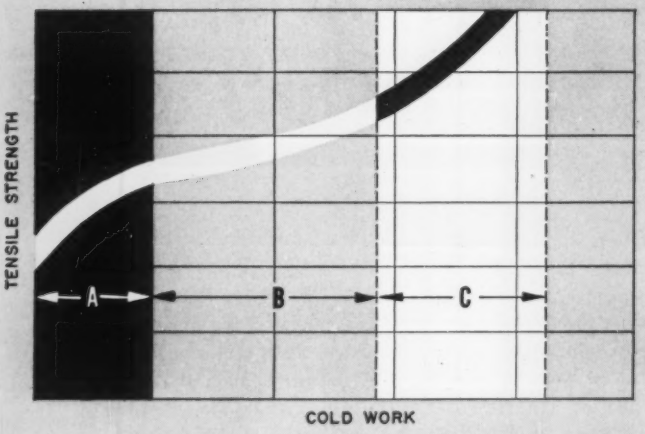
NEW WAY TO MACHINE— A patent issued to Carl Zeiss, Germany, covers drilling with a concentrated beam of electrons. The device has a source of electrons, a means to accelerate them, and a controller. Electrons are focused into the shape of a cylinder. Size depends on the hole desired. The electron beam rapidly melts its way through metal, it is claimed.

PROTECTS MOLYBDENUM— Chromalloy Corp., New York, says it has developed a process for diffusing chromium into the surface of molybdenum which will protect it against oxidation at 2000° F and higher.

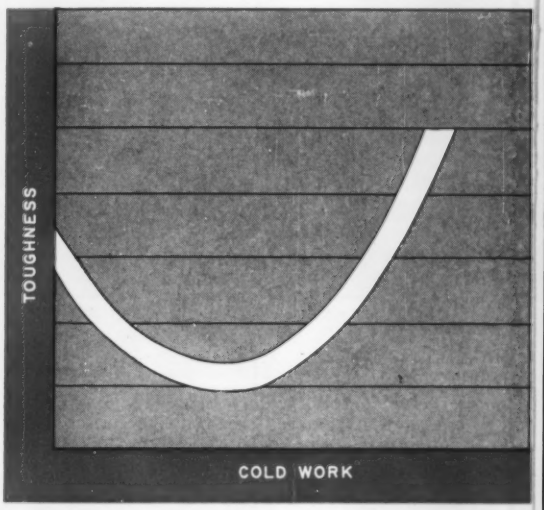
NEW ETCH— A process for etching printed circuits uses a solution of ammonium persulfate instead of ferric chloride or chromic acid solutions. Its developer, Becco Chemical Div., Food Machinery & Chemical Corp., Buffalo, cites these advantages: 1. All types of circuits can be etched in one system. 2. The etchant is relatively noncorrosive. 3. Sludge formation is avoided. 4. Copper can be recovered from spent solution. 5. Waste solution can be disposed of easily.

WELDING HEAT— Distortion in welded structures depends partly on the heat at the weld. Dr. Gerard E. Claussen's recent abstract of a German research article in the *Welding Journal* compares the amount of heat given off by bronze, wash coated steel, and medium heavy coated steel electrodes: The most heat is given off by the 6020 electrode and deep penetration types. Distortion measurements follow the same pattern as heat outputs.

Metalworking Outlook—Page 29 Market Outlook—Page 91



Tensile strength increases when larger reductions are used. The graph shows that cold working is most effective in small or large amounts. The midrange yields little benefit



Toughness can be improved when large reductions are used. Often producers stop before toughness begins to improve

How To Upgrade Cold-Finished Steel

A PROMISING potential for cold-worked steel lies beyond the colored zone in the graph above.

The zone marked "A" represents the area in which most cold finishing mills are working today. The middle zone has been explored, but the slight increase in strength and the marked drop in ductility have discouraged higher reductions.

One of the companies doing work in that area is La Salle Steel Co., Chicago. For more about La Salle, see Page 69.

Potential—A study by Dr. L. J. Ebert, associate professor and executive officer of the department of metallurgical engineering at Case Institute of Technology, Cleveland, points to these benefits from higher reductions:

- Higher tensile and yield strengths.
- Economy (carbon steels can replace alloy steels in some cases).
- Uniform properties throughout.
- Higher hardness with good machining characteristics.
- Excellent surface finish.
- Close control of finished size.

Those are the same benefits buyers of cold-finished steel have had for a long time. Its untapped potential lies in increased strength and toughness. (Carbon steels have been experimentally worked to 200,000 psi.)

How Study Differed—Other attempts have been made to evaluate the results of cold working. Most investigators have been confused by the relationship between the loss of ductility and the increase in strength.

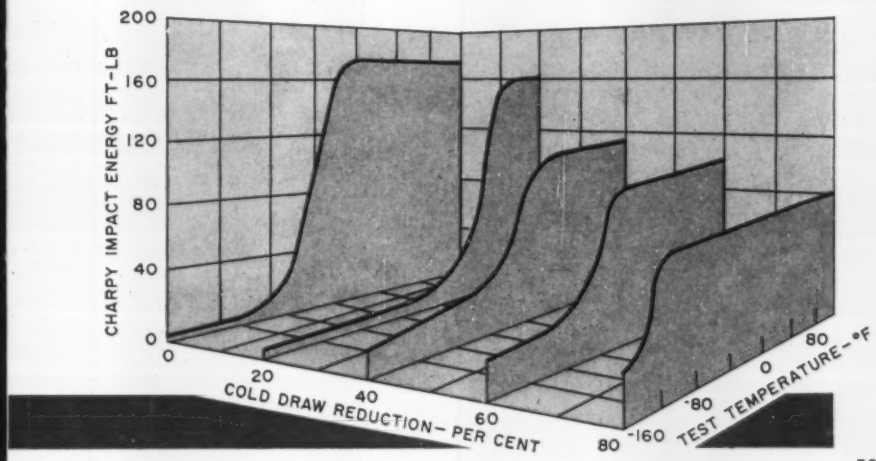
Dr. Ebert used the effect on toughness to correlate the results on tensile strength and ductility. Toughness is a function of both and is often measured by the Charpy impact test.

When the test is done at varying temperatures, the curves shown on Page 67 result. The temperature that marks the sharp decrease in the energy absorbed by the material is called the transition temperature. Cold work results in a higher transition temperature (lower toughness) through the middle range.

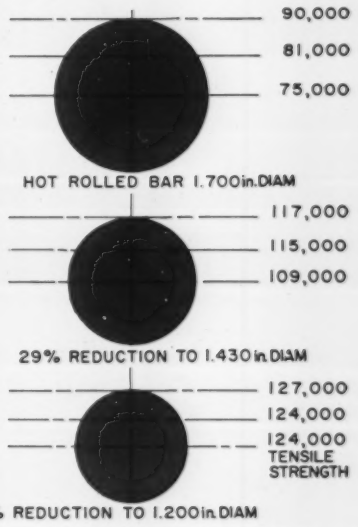
From that point on, the transition temperature begins to drop, and in some cases goes below the original as higher reductions are taken. At this stage, the material is tougher than it was originally.

Experimental Results — One of the steels studied by Dr. Ebert was AISI C1016, which has a hot-rolled tensile strength of 66,000 psi. A reduction of 20 per cent gave a 27 per cent increase in strength (84,000 psi).

Between 40 and 60 per cent reduction, the strength increases 7.5 per cent; from 60 to 80 per cent reduction, the increase is 13 per cent. The final strength is 115,000



The sharp transitions above are a measure of toughness (which depends upon tensile strength and ductility). Lower test temperatures indicate higher toughness values. Impact test curves on AISI 1016 show how toughness returns when high reductions are used



Cold working improves the strength of the material throughout the cross section. This is not the case in many methods of upgrading

Metallurgical study reveals potential strength and toughness of carbon steel are practically untapped by producers. Higher cold reductions lead to maximum benefits

psi, an increase of nearly 75 per cent over the hot-rolled material.

The example points out the mid-range where the effects of cold working are not significant in increasing the strength of the material.

Further Results—All steels are not capable of such high reductions. AISI C1060 was only worked to 40 per cent reduction in the tests. Strength rose from 107,000 to 143,000 psi, an increase of 40 per cent. Elongation decreased from 22 per cent to 7 per cent.

Effects of Alloys—Generally, the cold-worked strength of steel increases and ductility decreases with higher carbon contents.

Alloying elements generally change the hardness and strength of steel in the same direction as carbon, but the effect of carbon is more significant.

Increased carbon content reduces the workability of the material and changes the base line characteristics (the original tensile strength is higher and the ductility is lower).

The net effect of reduced workability and higher base line properties is a positive gain. Maximum cold-worked hardness and strength result from using higher carbon or low alloy steels rather than the plain low carbon steels.

Kind of Work—Another determining factor in the effect of cold working on steel (particularly on certain properties) is the type of deformation operation by which cold working was done. Different operations use different stress states to produce cold work.

In drawing, the stresses exerted are predominantly tensile. In extrusion, deformation is accomplished by stresses which are chiefly compressive. Stresses utilized in rolling and in cold reducing large tubes by a reciprocating rolling operation (Rockrite process) also are compressive.

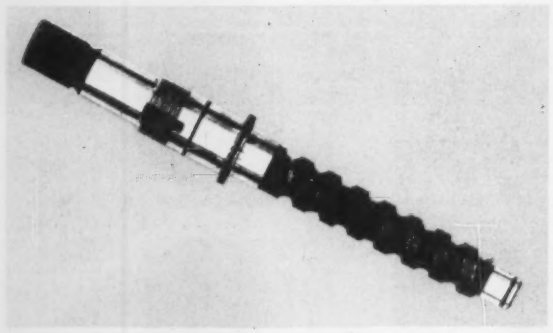
Effect of Working — Generally, for a given amount of cold work, deformation processes in which the dominant stresses are compressive produce less hardening and strengthening, but remove less ductility than those in which tensile stresses predominate.

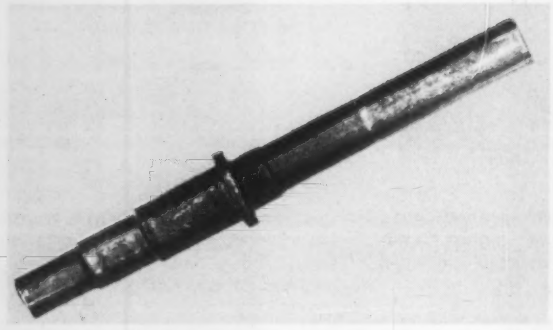
If it were possible to achieve the same tensile strength by tensile and compressive deformation methods, the steel cold reduced by compressive stress would be more ductile, tougher, and have a lower transition temperature.

Process Restricted—The use of compressive deformation processes is restricted, however. It is not practical to cold extrude long bars or rods. It isn't economical to cold roll round bars. Drawing is the most common cold reduction method used.

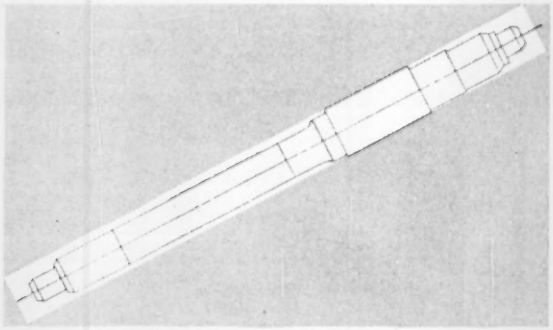
The drawbench, too, has its limitations. With the equipment we have today, it is impossible to cold draw large diameters of medium carbon steel to reductions greater than 25 to 30 per cent in area.

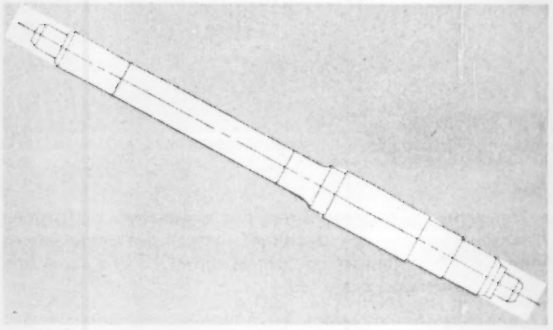
Residual Stresses — Cold working introduces residual stress into the material. Stress relieving will enhance final properties. For example, 1060 steel shows an in-





The die forming process developed by Republic Steel Co. forms the blank shown in the lower left. It is used to produce the finished product shown above





Large material savings are realized by using die forming. Blanks approximate the finished shape much better than regular bar stock. Savings of one-third can be realized

crease of 13 per cent in maximum yield strength after stress relieving (113,000, compared with 100,000 psi).

The most widely used process for the reduction of residual stresses is a low temperature anneal. It is effective since it relieves the elastic distortion of the atomic lattices that is caused by cold working.

Excessive Cold Working — The undesirable results of overworking steels are generally connected with the loss of ductility. An example of this is cupping (see photo on this page).

Cupping is caused by stresses set up as the outside layers of the bar move faster than the inside ones. It is a function of the soundness of the steel and the amount of reduction.

The upper limit on reductions that are free from this effect is normally considered to be around 50 per cent. However, sound parts have been made with considerably higher reductions.

A Die-Forming Process—Republic Steel Corp., Cleveland, has developed a method of cold working that pushes the dies over the blank. The dies work in from opposite ends to the specified distance, then are stripped off. The operations can be repeated to give further reductions.

This cold forming produces parts that closely outline finished shape and size. A finish cut and grinding are all that are required to complete the part.

Machining time is reduced by decreasing the amount of material that must be removed. Material savings of 35 per cent can be realized. A rifle barrel blank produced for a gun manufacturer was formed with savings of 45 per cent.

Reductions of 50 per cent are made with no adverse effects. Machinability is improved because of finer grain structure.

The largest potential seen by Republic engineers will be in shafting. Parts that warp during heat treating also lend themselves to the process. It may replace hot forging in some areas.

Producer's Yardstick — E. E. Bishop, metallurgical engineer and manager of product development

Cupping is a harmful effect caused by

for Wyckoff Steel Co., Ambridge, Pa., uses these factors to determine the magnitude of reduction: Chemical analysis, hot-rolled size, allowance for over-rolling tolerances, and shape or section involved.

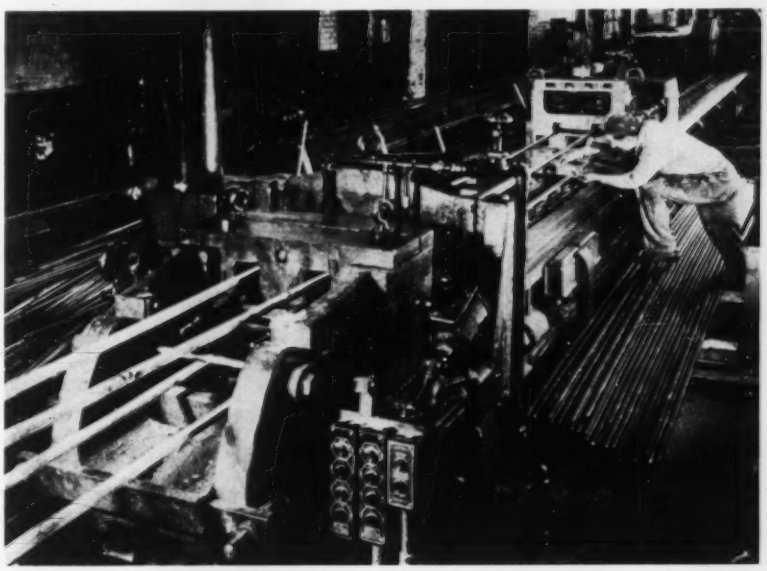
Wyckoff does not normally use large reductions. Its engineers believe practical application for this type material is best where the alloy, heat-treated material is not required and where higher strength or hardness is the main physical property needed.

Another Producer — Bliss & Lauglin has gone into higher reductions for special customer problems. The firm has produced steels with 145,000 psi tensile and 125,000 psi yield strengths.

G. R. Caskey, chief metallurgist, states that reductions in area reach nearly 45 per cent on some of the small bars. B&L uses roller straightening and controlled heat treating for stress relief.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

excessive cold working



A typical draw bench at LaSalle Steel Co.

Cold Working Methods at LaSalle

"WE believe that partmakers have only begun to realize the advantages in cost savings and quality they can get by using bars made by new cold finishing methods."

That view is expressed by E. S. Nachtman, director of research and development at La Salle Steel Co., Chicago. He illustrates it by referring to three of his company's developments:

- A special drawing die practice (the T-die).
- Controlled copper additions.
- Elevated temperature drawing (E.T.D.)

The T-Die—La Salle has developed a new drawing die. It controls the distribution of deformation forces to prevent the introduction of major stresses during forming. Before the use of the die, warping and cracking were always major problems in severely cold worked steel bars.

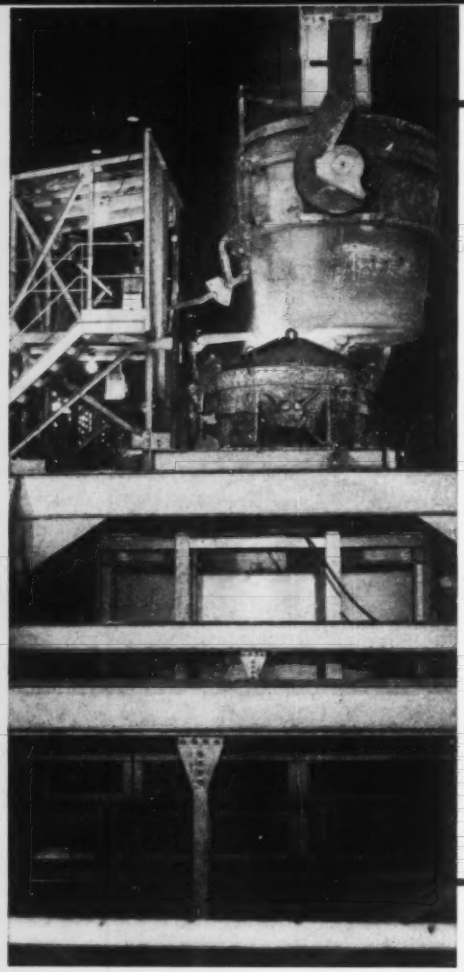
Effects of Copper—Additions of copper improve the quality and machinability of cold-finished steel bars. Laboratory and field tests show a 10 per cent improvement in machinability. Copper also adds resistance to atmospheric corrosion and in many applications improves the wear resistance of the material.

Both developments are applied to a La Salle product called Stressproof, a steel bar widely used for production and maintenance applications.

E.T.D.—With the elevated temperature process, steel bars are deformed at a point well above room temperature but below 1200° F. This process is used to achieve high strengths previously available only in quenched and tempered materials. Improved machinability and wear resistance, as well as better over-all qualities, result.

La Salle's initial product made by the E.T.D. process is called Fatigue-Proof. Increased strength achieved through these processes eliminates the cost of heat treating and its attendant problems: Discoloration and scaling, warping and cracking, nonuniformity of structure, additional handling and inspection, as well as secondary machining.

Applications—These cold finished steel bars are replacing carbon and alloy grades for shafting applications; higher motor speeds are creating higher torques and require greater strengths. They are also being used for gears, studs, critical machined parts, and for pistons in hydraulic and pneumatic equipment.



Applications for Degassed Steel

Forgings

Turbineshafts, propeller shafts, crankshafts, and high stress forgings in all sizes.

Large Castings

Those requiring minimum porosity because of leakage requirements or machined surface characteristics.

Armature and Transformer Steels

Degassing permits altered melting practice to produce low hysteresis loss irons and steels.

Deep Drawing Steels

Improved ductility and reduced inclusions give a superior surface finish.

Vacuum stream degassing unit at U. S. Steel Corp.'s Duquesne Works uses a second ladle so ingots can be poured from multiple furnace heats

Vacuum Stream Degassing Takes Hold

Two producers have units in full operation, and more are planned. It's the cheapest process for vacuum refining. Consistent results can be obtained on 250-ton ingots

THREE vacuum methods—induction melting, consumable electrode melting, and stream degassing—are being used to process today's specialized, expensive metals.

Of the three, vacuum stream degassing offers the most economical refinement of tonnage quantities of steel, declares K. C. Taylor, manager of the vacuum degassing department, F. J. Stokes Corp., Philadelphia.

Mr. Taylor talked about the latest developments in stream degassing before the Committee on Vacuum Techniques in Boston and the Second World Metallurgical Congress, ASM, in Chicago. He said it can process 250 tons of metal in a single heat—100 times the largest induction melted, vacuum furnace heat.

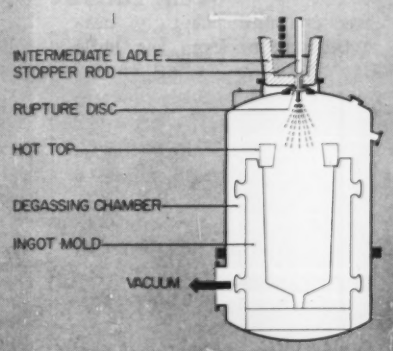
Here's how he compared the costs of vacuum refining a pound of steel in tonnage quantities (without development expenses): Induction melting, about 40 cents; consumable electrode melting, 20 cents; and stream degassing, 1 cent.

Operating Units—Two producers have stream degassing units in operation — Bethlehem Steel Co., Bethlehem, Pa., and U. S. Steel Corp., Duquesne, Pa. Installations are being planned by steel companies and producers of large forgings and rolls. Some are under construction.

In vacuum stream degassing, molten metal is poured into a high vacuum which refines it by with-

Advantages of Vacuum Stream Degassing

1. Elimination of gross gaseous inclusions.
2. Reduction of hydrogen content to 1½ ppm.
3. Reduction of heat treatment cycles.
4. Reduction of oxygen content.
5. Reduction of nitrogen content.
6. Reduction of oxide inclusions.
7. Ten per cent or more increase in ductility.
8. Finer grain size.
9. Reduction of hysteresis losses in electrical steels.



Schematic of typical equipment for degassing into an ingot mold. The same equipment, without modification, can also do ladle degassing, static or "percolation" degassing, or shape casting within the vacuum chamber

drawing gases and evaporates high vapor pressure contaminates.

Discovered in the late 1800s, the process only recently has come into significance. Interest was fostered by steel forging manufacturers who sought relief from flaking or the microcracks caused by excessive hydrogen content of an alloy steel.

Analysis—Forging steels (4300 series is an example) had a hydrogen content as-poured of 3 to 8 ppm. Considerable heat treatment was necessary to reduce hydrogen and avoid the development of cracks, especially in large cross sections.

If the steels could be poured into ingots at a hydrogen level of 1.5 ppm, all hazard of flaking would be gone.

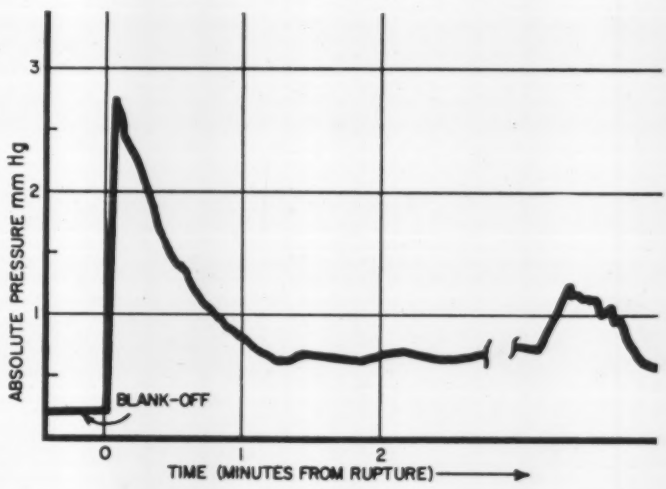
Operation—In a typical stream degassing installation with a capacity of 100 to 120 tons, the degassing chamber base section, with vacuum pumping port, is permanently installed in the pit of the melt shop. The complete mold assembly is placed in this base.

About 30 minutes before the scheduled pour, the bell section is positioned over the mold. The chamber is sealed with an aluminum membrane or rupture disc over the pouring opening. The chamber is evacuated by multiple stage steam jets in a 15 to 20 minute period to the system blank-off pressure, which is as low as 10 microns.

Degassing—The molten steel can be carried to the chamber by a single ladle; or a second, smaller ladle can be inserted between the furnace ladle and chamber as a poring box. The second ladle permits the use of multiple furnace heats.

Degassing is begun once a ferrostatic seal or head is formed about the ladle nozzle. The stopper rod is lifted; the molten steel melts the rupture disc; and the stream of metal diverges into a spray.

Effect of Vacuum—Entering the



Typical vacuum levels in production stream degassing. Initial peak is gas flashed from mold and nozzle surfaces by the metal stream. Final peak is caused by water vapor from the refractory hot top

DEGASSING . . .

evacuated chamber, the tight, narrow metal stream from the ladle nozzle is torn apart by the gas being released and reaches several feet in diameter.

The falling metal takes various forms; it can best be considered as irregular, luminous drops or peas, some of them ranging to stringers. It is the exposure of such large surface areas to the vacuum that makes refinement possible.

As long as the stopper rod seal is maintained, metal flow can be controlled. After completing the pour, the stopper rod is closed as the furnace slag is about to enter the chamber.

The vacuum can be maintained, or the vacuum break valve opened, the unit disassembled and the ingot permitted to solidify.

Steam Ejector—The design and layout of the steam ejector is highly important. Normally, a four or five stage ejector is used; sometimes a six-stage unit is required. Ejector designs are based on metal pouring rate (up to 10 tons a minute), alloy composition, mold and ladle sizes, refractory schedules, degassing chamber volume, and process applications. A pumping capacity of 60,000 cfm equivalent at 600 microns could be considered typical.

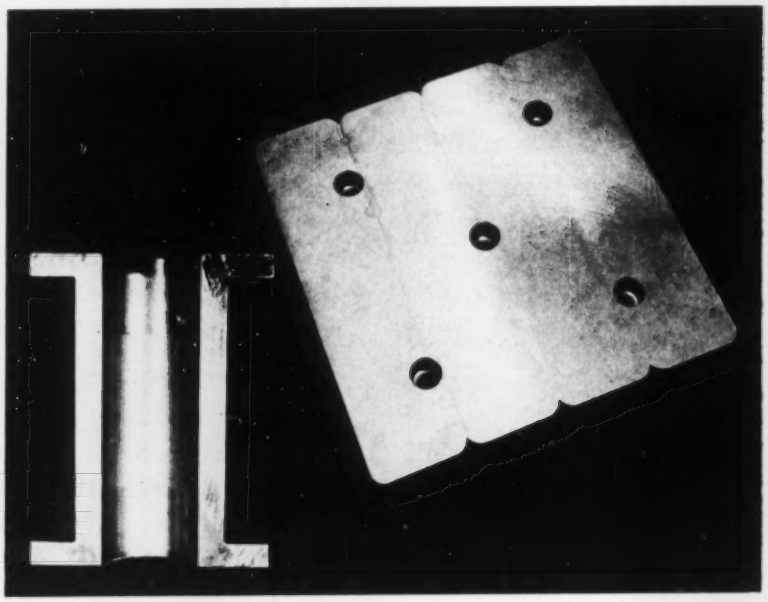
Utility costs for such a unit are low, considering the work done. (It's less than $15 per major heat.)

Vacuum Levels—The graph on Page 71 shows typical vacuum levels being obtained on degassing chambers. The analysis of the gas removed varies with the alloy processed. Typical analysis: 40 per cent carbon monoxide, 30 per cent nitrogen, and 30 per cent hydrogen.

Steel companies have released little information on the physical properties of degassed steels.

Tonnage production heats have been poured with as low as 100 microns sustained vacuum. The original objective of 1.5 ppm maximum hydrogen content has been sustained consistently, even on the 250-ton ingots.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.



The flanged half bearing (left) is for a blooming mill. Two powdered metal ends and center section are silver soldered. Bearing (right) is made of four pieces, 2 x 3 x 12 in.

Bigger Powdered Bearings

You can overcome their size limitations by joining components with silver solder. The method can be used on any bearing or part, it is claimed. Here are two examples

THE BEARINGS in the above illustration are made by joining several sections of powdered metal with silver solder.

It's a new way to solve the problem of making outsized, self-lubricating bearings, says the fabricator, Apex Bearings Co., Hudson, Ohio. The method can be used on any bearing or part made of powdered metal.

Need — The Pittsburgh - Des Moines Co., Neville Island, Pa., needed a large wear plate for a supersonic wind tunnel being built for a U. S. Air Force research center. The largest available was 2 x 3 x 12 in. Joining four with silver solder formed a bearing plate which was large enough—2 x 12 x 12 in. The firm worked with the Amplex Div., Chrysler Corp., Detroit, during construction.

The Air Force wind tunnel uses 36 of the wear plates. They must withstand loads up to 14,000 psi. The bearings can't be lubricated after installation.

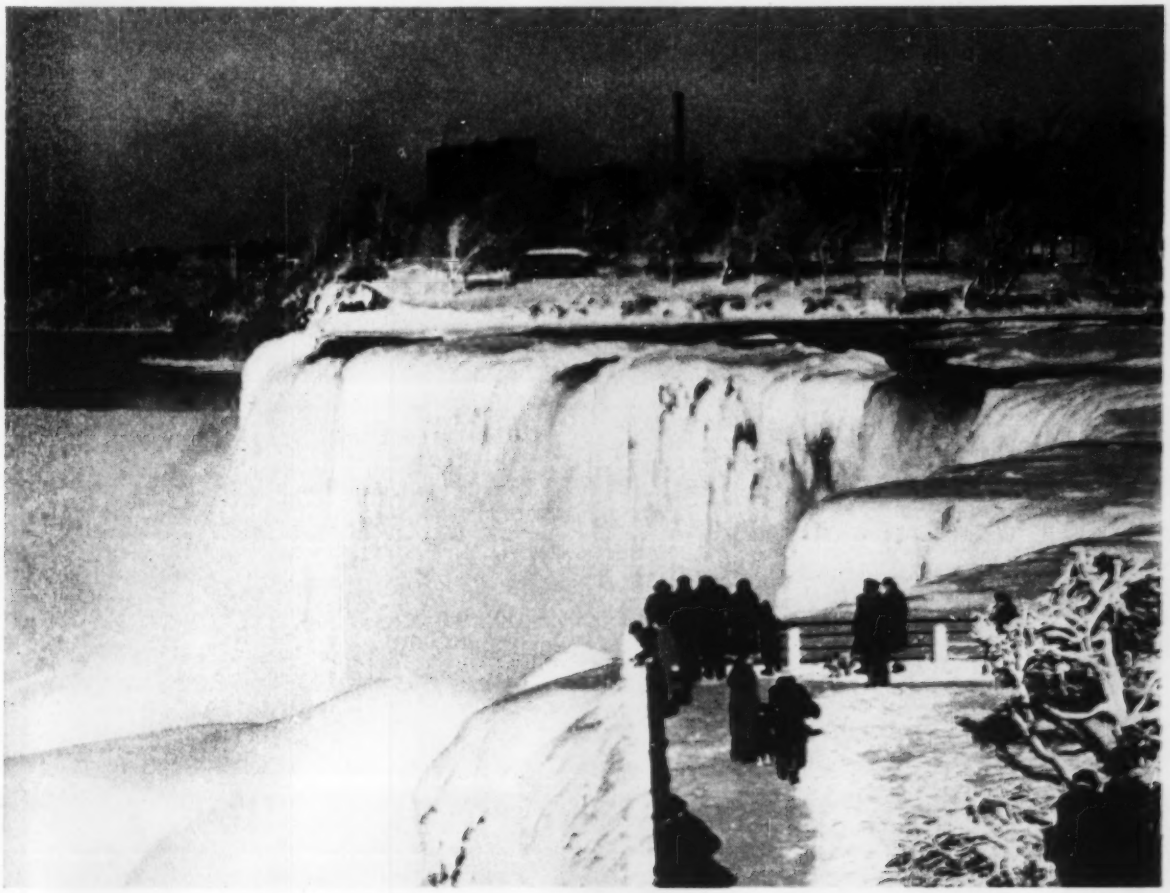
Soldering, drilling, and counterboring do not affect the lubricating properties of the sintered metal.

Other Uses—The firm has built similar bearings for use in rolling mills. The one shown on the left will be installed in a blooming mill. It is 10 in. long. Flanges are ¾ x 9 in. Inside diameter of the body is 4½ in.; its outside diameter is 5¾ in.

Such bearings have identical halves; each is made from three pieces joined by silver solder.

Powdered metal bearings are expected to outlast other types. They retain their lubricating qualities under extremes of heat and pressure. Maintenance is greatly reduced.

ANTISEP the all-purpose water-soluble cutting base



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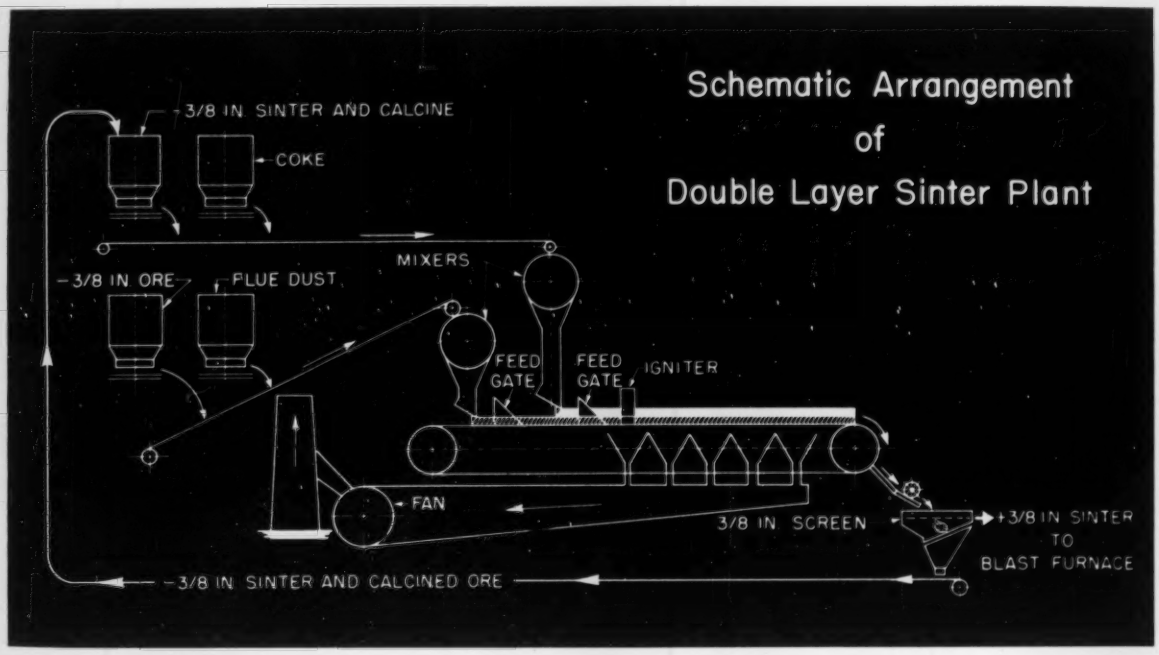


French Get Two-Layer Sinter Plant

Twice-through process calcines and sinters in separate steps. Advantages are claimed in fuel economy, low coke breeze consumption, and stronger sinter

A SINTERING PLANT which separates calcining and sintering processes in the same strand is planned by a British firm. Huntington Heberlein & Co. Ltd. will construct the plant in the Lorraine district of France for use with French ores.

The process superimposes two layers on the strand. The top layer forms a true sinter; the bottom layer is for calcining only. Calcined material is returned to the upper layer, so that most feed material makes two circuits.

Bottom Layer—Calcining is done by hot gases drawn down through the sintering bed, plus the addition of a small proportion of fuel. Gases drawn down from the upper layer are not hot enough to complete the calcining of the ore without the addition of some solid fuel in the calcining layer—in most cases carbon from the uprising flue dust.

The system superficially resembles other two-layer processes in which each layer has a different carbon content. The important difference is that in the Huntington Heberlein process each layer has a distinct and separate function.

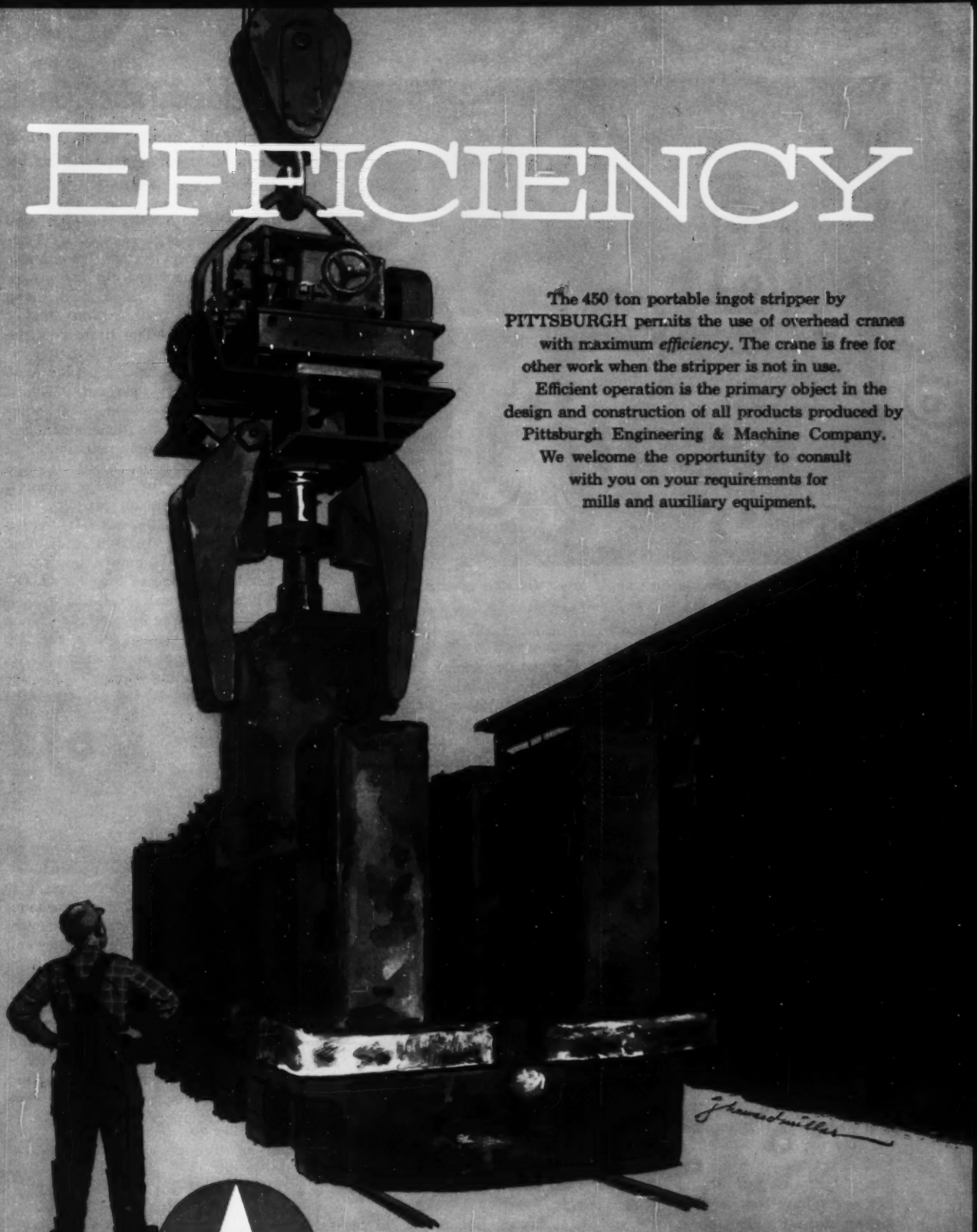
Top Layer—No raw ore is added to the upper layer. It consists of returned calcined material from the lower layer plus returned sinter fines arising from sintering of the upper layer.

The two materials intermingle at the end of the machine and return to the feed bins after passing through a screen. The diagram above shows the circuit of materials through the process.

Advantages — The process was described at the recent International Symposium on Sintering by R. F. Jennings of Huntington Heberlein. He stated that there is a considerable economy in total heat requirements, since the waste gases from the sintering process and the sinter cooling are both fully used in calcining.

Sintering air is preheated by burning blast furnace gas over the

EFFICIENCY



The 450 ton portable ingot stripper by PITTSBURGH permits the use of overhead cranes with maximum *efficiency*. The crane is free for other work when the stripper is not in use.

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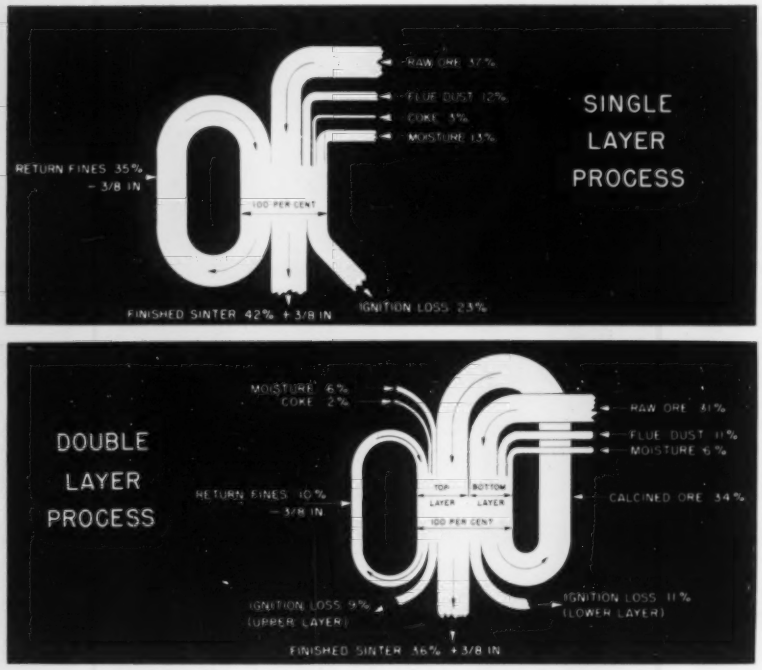


Materials balance in double and single layer sintering processes

entire sinter bed. This reduces coke breeze consumption. Lower waste gas temperatures give a saving in grate life without the use of a special protective hearth layer.

Most of the calcining takes place after sintering in the upper layer of the bed has been completed, and this gives time to cool the finished sinter in the upper layer so that a separate sinter cooler is no longer required. The calcined ores from the lower layer may be cooled by water quenching without harm.

Separation of the calcining process gives a stronger sinter and substantially reduces the amount of the return fines used in the true sintering process. When producing blast furnace sinter ($+\frac{3}{8}$-in. square mesh) the over-all proportion of the return fines in the bed is reduced from 35.3 per cent in the conventional sintering process to 10.3 per cent.

Limitations—For a given size of machine the output of finished sinter per square foot is bound to be lower since the calcining process is added after the normal sintering process and proceeds at a somewhat slower pace. Output is reduced in ratio to the yield from the total mix. This disadvantage, however, is balanced by the elimination of a separate cooler, which means that the capital cost of the plant is about the same or may be even lower than that of conventional plants.

Cooling and calcining take place at high suction and this increases the total fan power needed. This is offset by the lower temperature at which the sintering fan operates.

Moisture—The ore in the lower bed after calcining must be rewetted for permeability control before it can be used in the upper sintering layer. A small amount of extra heat is required to dry off moisture.

The lower temperature of the waste gases may impose some difficulties in dust removal (with the usual de-dusting system it is necessary to maintain the waste gases above the dew point). Reducing the temperature well below the dew point by wet washing the gases would have several important advantages. These two stand out:

1. Power consumption of the fan would be reduced.

2. Water and sulfur would be recovered from the process instead of being dissipated with the stack gases.

Welded Tubes Gain

Hydraulic jacking and pulling equipment among new uses for carbon steel type

THE INCREASING use of welded steel tubing is illustrated by Templeton, Kenly & Co., Broadview, Ill. Its redesigned line of standard hydraulic jacks and hand pumps uses 1020 carbon steel.

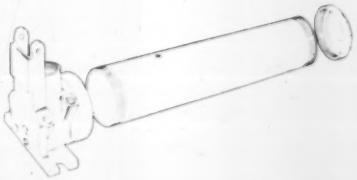
Advantages—The basic new design meets rated weight lifting capacities up to 100 tons, plus a 50 per cent safety overload. Welded steel tubing is economical since uniformity of its dimensions and thickness eliminates machining.

Reservoir tubes used in the eight models of the company's jacks (3 to 100 ton capacity) are now made of $2\frac{3}{4}$-in. OD welded tubing with a 0.120-in. wall. Two models of hand pumps use reservoir tubes made of 3 and 4 in. OD tubing with wall of 0.120 in.

Reasons—The Formed Steel Tube Institute, Cleveland, says the use of this tubing in hydraulic jacking and pulling equipment is increasing because of its strength-to-weight advantages and production savings.

The institute says design engineers working with hydraulic jacking equipment have been confronted with the problem of providing lightweight, portable equipment with a strong hydraulic mechanism to withstand intense pressures.

The master cylinders, reservoir cylinders, and other components of hydraulic equipment require uniformity in concentricity and close dimensional tolerances — usually obtained by machining and honing. Welded steel tubing, says the institute, provides these requirements along with availability in exact sizes and gages, relatively low cost, and minimized surface refinishing requirements that save production operations.



Lightweight welded tubing used in this hydraulic jack cylinder withstands the pressure of 100-ton lifting capacities

Too Big a Bite

Making plate wider and thinner at the ends solved problem of small gripping jaws

ENGINEERS at Kaiser Aluminum & Chemical Corp.'s Trentwood rolling mill, Spokane, Wash., recently fitted an aluminum plate 4½-in. thick into a plate stretcher tooled for a maximum opening of 3 in.

They did it by fishtailing the ends of the material.

The job was done for Convair, a division of General Dynamics Corp., Ft. Worth, Tex. The firm needed a stress relieved, stretched section of 2014-alloy plate for Convair's B-58.

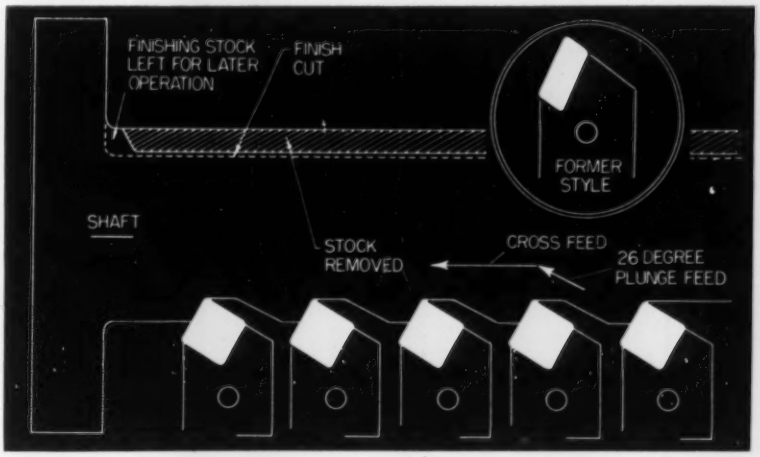
Sequence — After rolling, the plate (4½ in. thick, 30 in. wide, 200 in. long) was sent to General Machinery Co., Spokane. Ends were sawed square and taper-milled on a horizontal boring mill equipped with tooling to remove metal at both ends, forming wedges about 18 in. deep.

FISHTAIL
. . . whips size problem

A half-circle was milled into each edge of the plate at the point where the taper started. Metal between the half-circles was sawed lengthwise, leaving the plate 19 in. wide between fishtailed ends.

Sawing was done by mounting the plate between centers on a lathe carriage with the saw blade parallel to the floor. Clearance for the saw was provided by wooden wedges which were driven as the saw progressed.

The Trentwood plant's stretcher is one of the largest in service. Kaiser Aluminum's new rolling mill at Ravenswood, W. Va., will be equipped to stretch plates up to 6 in. thick and 12 ft wide. They will be used for aircraft wing panels and similar structures.



Here's the setup that saves $7200 a year, say engineers at Wesson Co., Detroit. Carbide squares can be turned, presenting four cutting edges successively

Change Cuts Carbide Cost

TURNING a tractor axle at Wesson Co., Detroit, used to cost $2 per shaft for tools.

Redesigning to five tools cut that to 7 cents.

Here's the approach tool engineers used:

Breakdown — Original tooling was a brazed carbide. Equipment: A 75-hp lathe.

Engineers noted that there was too much carbide breakage, even for the grade used. Grinding costs were too high because of frequent tool changes and excessive setup time.

They also suspected that production per tool was low.

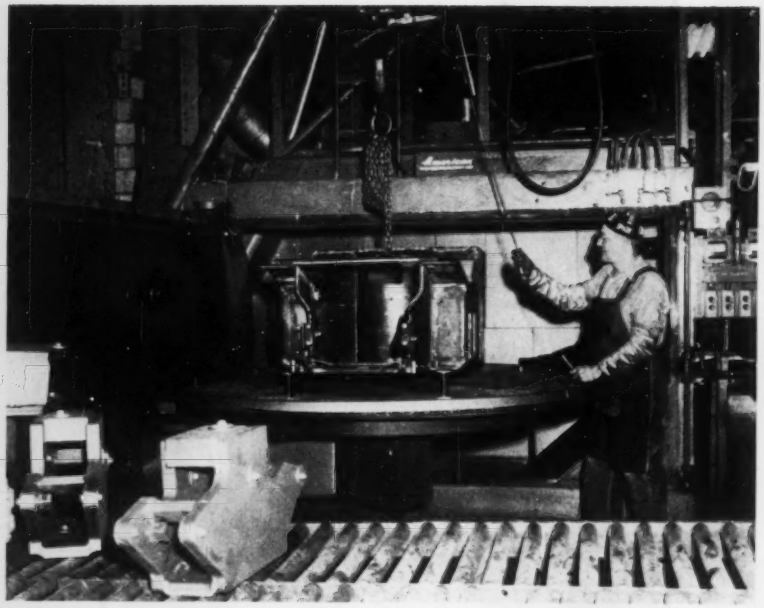
The old, narrow range carbide was replaced by a general purpose cutting grade. It was tougher and broke less frequently.

The change made possible a switch to indexing type carbide inserts (see illustration). Square instead of rectangular shapes doubles the number of edges per grind. Indexing cuts setup and downtime after grinds. The square shapes also are standard which helped cut the cost.

Pieces per cutting edge rose from 15 to 40. Production is almost double per machine hour.

The table below compares the old method and the new:

	Before	After
Cutting speed, sfpm	275	275
Feed per revolution (in.)	0.017	0.017
Depth of cut, max (in.)	⅝	⅝
Machining time, minutes	6½	6½
Tool change, minutes	5	5
Production per hour	2½	5
Pieces per tool change	15	40
Pieces per grind	30	320
Pieces per tool insert	120	2560
Grinding cost per tool	$27.00	$12.00
Initial tool cost	$79.77	$55.28
Total cost per piece	$2.09	$0.066
Annual savings per machine		$7200.00



This Hyster Co. weldment is being loaded on a swing table which carries it into blast cabinet. The firm says savings average about 50 per cent, compared with hand cleaning

Clark Equipment Co., Benton Harbor, Mich., cleans its parts prior to welding. Before and after pictures (above) show effectiveness

Abrasive Blast Cleans Weldments

It eliminates time-consuming hand operations. Here are reports from several manufacturers who tell how the process cuts their costs and improves quality

CLEANING weldments with a blast of abrasives is fast, versatile, and inexpensive, says the Hyster Co., Danville, Ill. It makes industrial lift trucks and material handling machinery.

The firm cleans a welded frame for a lift truck in 3½ minutes with a Wheelabrator machine. The job formerly took 90 minutes of hand wire brushing.

Another example: Frank G. Hough Co., Libertyville, Ill., makes a complex weldment for its tractor shovel. It used to take 3 to 4 hours to clean one. That time was cut to 10 minutes with blast cleaning, and difficult corners are cleaner.

Requisites—Solving these problems improves weldments: Rust and scale on parts to be welded (they interfere with the making of sound welds); and spatter, flux, and oxides on finished weldments (they spoil finished surfaces).

Selection — Another machine made by Wheelabrator Corp., Mishawaka, Ind., the Tumblast, is equipped with automatic loaders. They are used for parts that can withstand a little tumbling action. They work best with big quantities of small and medium parts.

Parts are exposed to a blast of abrasive particles from several units inside the chamber. Parts may be tumbled, spun on a hanger, revolved on a worktable, moved by a skew-dished roll, rubber conveyor belt, or special work carriage. The handling system takes the place of an operator.

Construction — An airless blast unit is a bladed wheel which throws a metallic abrasive such as steel shot or grit in one direction. It handles as much as ½ ton of shot each minute.

The blast is said to penetrate the remote corners of complicated assemblies.

Here are other advantages claimed for the process:

The abrasive particles ricochet, an action which cleans cavities and holes perfectly.

It leaves an etched surface which improves paint and enamel bonds.

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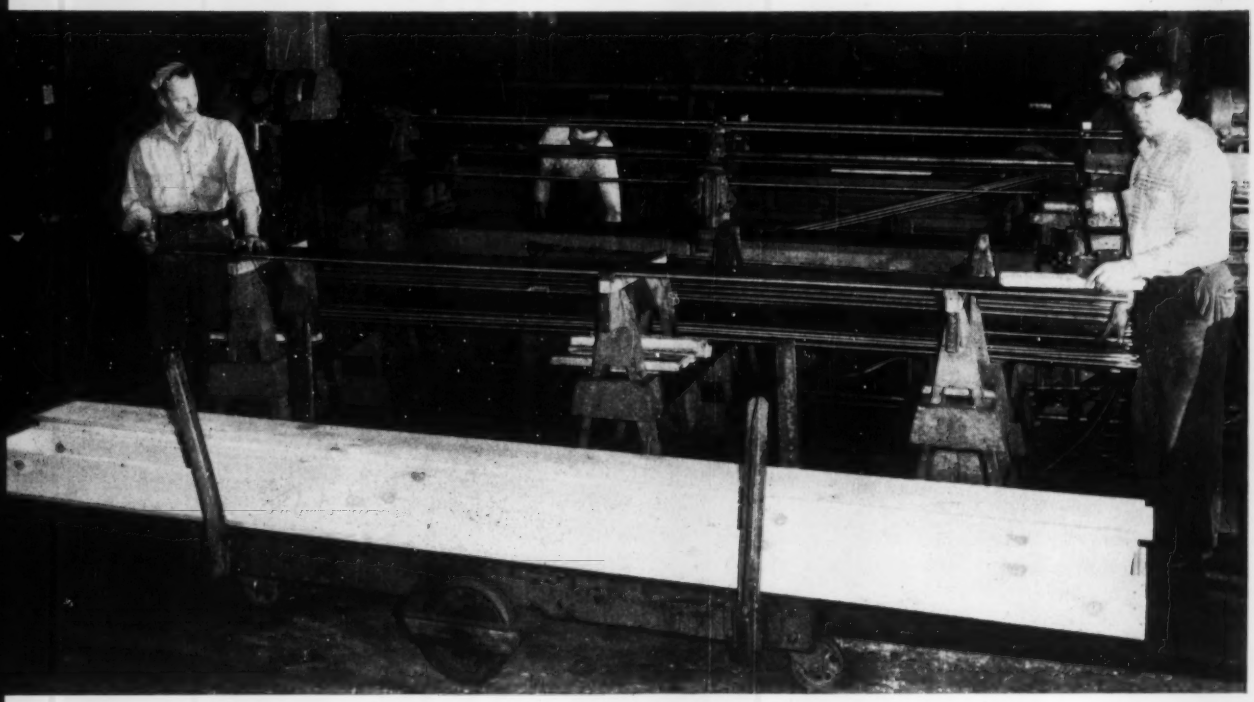


Major improvement in Wolverine Tube's packaging program is in-process inspection which permits packing to be done at last manufacturing operation. Two men in foreground inspect finned tubes before placing them in shipping container

Making Packages Better, Cheaper

Tubing manufacturer keeps costs down by engineering the package as well as the product. Better customer service and increased sales are added benefits

MANUFACTURERS of intermediate or semifinished products often regard packaging as a necessary evil that increases overhead but adds no value.

Not so at the Wolverine Tube Div. of Calumet & Hecla Inc., Detroit. Its planned program has kept down the cost of packaging copper, brass, and other types of tubing. Packaging improvements have enabled it to provide better customer service, and, in some cases, have increased sales.

Approaches — Several methods were tried to reduce packaging costs. The most obvious one was to increase the weight per package. An effort still is being made to get customers to accept heavier unit loads. Sizable savings have been realized because tare shipments have been reduced as much as 50 per cent.

Other steps include use of less expensive packaging materials without sacrifice in product protection; reduction in the labor cost of making containers; outside purchase of containers; and elimination of the container.

Cheaper Packing — Ten years ago, Wolverine Tube packaged hard copper water tubing and brass pipe in solid wood boxes of 300-lb capacity. Costs were cut considerably when the division switched to paper tubes and fiberboard boxes. Finally, packaging was eliminated; the material is shipped in 100-lb bundles. (A few customers still specify containers.)

Commercial stock in coils was packaged in wirebound veneer crates which weighed about 250 lb loaded. When customers started to use fork trucks, the division switched to palletized crates weighing up to 1500 lb. They were made at the mill until a few years ago.

Coiled tubing is packaged in individual, reel-type cartons that provide maximum convenience in use and offer distinct product identification

By J. L. HADDOCK
Traffic Manager
Wolverine Tube Div.
Calumet & Hecla Inc.
Detroit

Management found that wirebound crates and heavy paper containers could be purchased at substantial savings in material and labor.

Recently, paper drums were introduced to take the place of small wirebound crates for customers unable to handle heavy pallets. They cost about the same as crates, but the labor required to assemble them has been eliminated.

More Examples — Commercial straight stock in short lengths and manufactured parts were once packaged in small wooden boxes. They were replaced by large palletized containers made at the mill. Finally, fabrication costs were eliminated by buying them from suppliers.

Commercial straight stock in long lengths was packed in wooden boxes (capacity of each, 300 lb.) Less expensive fiberboard boxes are now used for 300-lb loads. Customers who can accept heavier packages get wooden boxes with capacities of 1000 lb.

Construction Savings—Container construction has changed. Lumber was purchased in random lengths up to 20 ft. A study showed that 20 ft tubing was one of the most common lengths ordered. Part of the lumber now is ordered in exact lengths (20 ft 4 in.) to accommodate the 20 ft tubes.

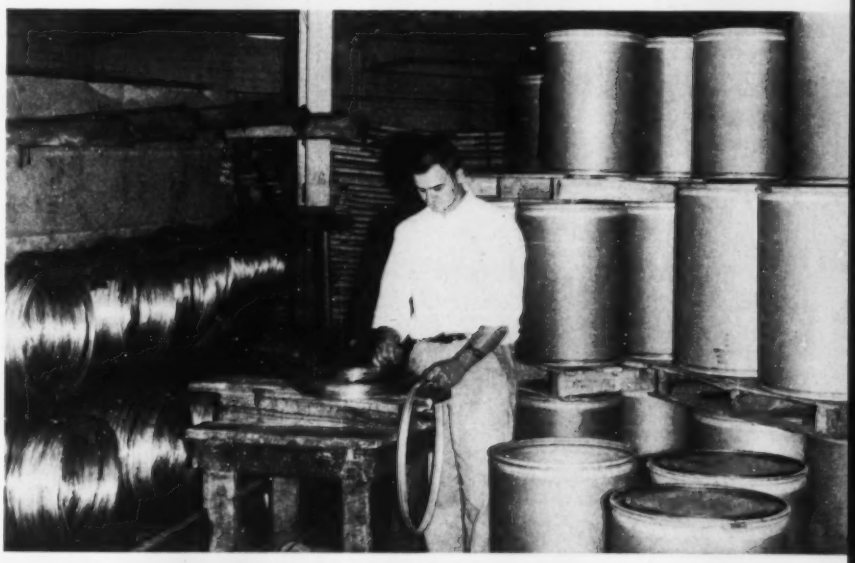
When 100-lb capacity wooden boxes were first used, they were made with double sides using 6/4 resaw lumber. Now they are made with only one thickness of lumber. Experience indicated that most customers who accept the heavy boxes unload by crane and double sides are not necessary since the boxes receive little abuse.

Mechanization—The cost of box construction was also reduced by installation of a nailing machine to replace many hand operations. Hand nailing is still required for nonstandard containers and special types of skid boxes.

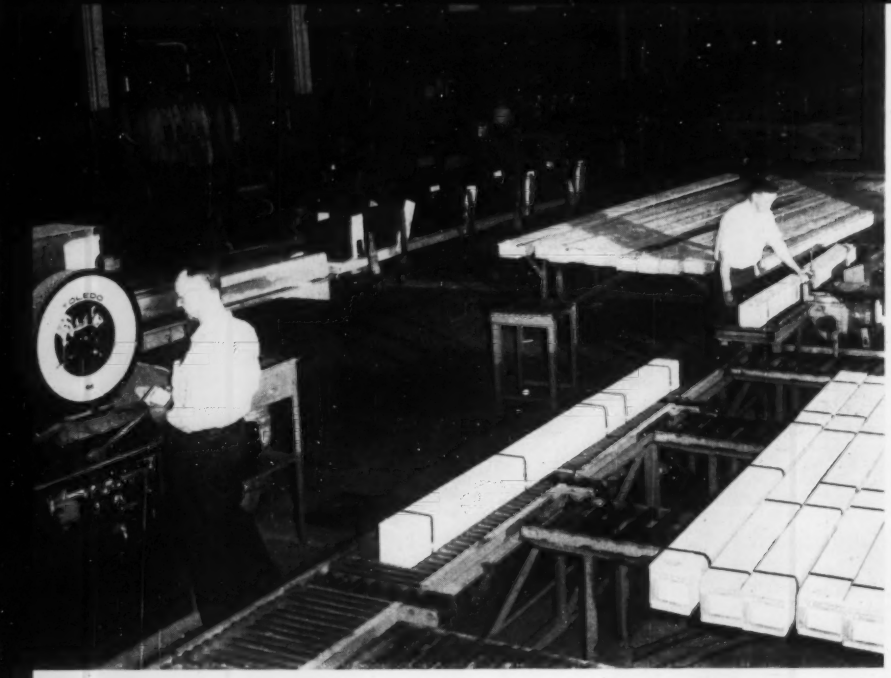
The cost of applying steel strapping has been cut by a change to semiautomatic banding and weighing in a continuous operation on a roller conveyor.

Inspection Move—A change in the inspection program has been a major step. All products used to be delivered to the inspection department for final inspection and packing.

The new method of in-process inspection permits the packing to be done at the site of the last manufacturing station—often by the man who does that operation. It gives inspectors more time to do



Some commercial coiled stock is packed in paper drums purchased outside. Package cost is same as crates, but labor to assemble crates is eliminated



Cost of applying steel strapping has been cut by a change to semiautomatic banding and weighing in a continuous operation on a roller conveyor

their main job, and it cuts handling operations.

Sales Tool — Coiled tubes for water, refrigerator, and automotive applications used to be packed in 250-lb capacity wirebound crates. They were replaced by individual and master cartons. Individual cartons hold 2 to 4 lb, master cartons hold 40 to 50 lb.

Corrugated cardboard cartons offer no savings over the veneer crates, but the system is much more convenient to the customer. They stimulated an increase in sales.

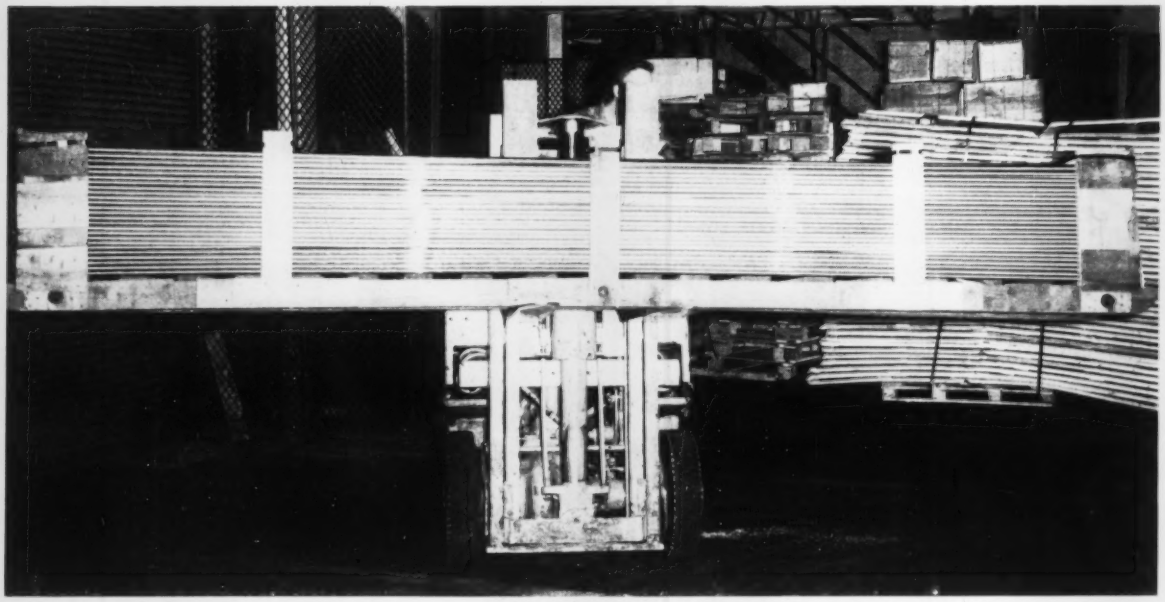
A reel-type carton was developed to replace the conventional square one used for the individual container. It provides even more convenience in product use and offers distinct identification for a "standard" item such as tubing.

Customer Service—For one air conditioner manufacturer, the company developed a 3000-lb capacity skid for handling finned tubing. The skidded shipment is delivered to production, and the tubing is fed directly to the machine; the skid acts as the customer's rack. When it is empty, it's returned to the plant for re-use.

Increasing weight per package solved a serious production problem for a refrigerator manufacturer. Stock had to be handled by overhead crane, and the union required all machines to be shut down while the crane was delivering stock to a machine.

The old package weighed 500 lb, enough stock for one-third of a shift. A new package was developed to hold enough material to feed the machines for a full shift.

For packaging long, U-bend tubes used in heat exchangers, a container of 6000-lb capacity was developed. A complete set of heat exchanger or condenser bundles can be packed in one container in reverse order, so the bundles can be fed directly into the equipment from the package.



Skid with 3000-lb capacity for finned tubes was developed for air conditioner manufacturer. Skid is used as a rack; tubes are fed directly to machines

UNITED ENGINEERING AND FOUNDRY COMPANY

Pittsburgh, Pa.

(Advertisement)

SPECIAL REPORTS ON FINISHING NON-FERROUS METALS

NUMBER III—Lustrous, Corrosion-Resistant Finishing with Chemical Polishing Iridite

WHAT IS IRIDITE®?

Briefly, Iridite is the tradename for a specialized line of chromate conversion finishes. They are generally applied by dip, some by brush or spray, at or near room temperature, with automatic equipment or manual finishing facilities. During application, a chemical reaction occurs that produces a thin (.00002" max.) gel-like, complex chromate film of a non-porous nature on the surface of the metal. This film is an integral part of the metal itself, thus cannot flake, chip or peel. No special equipment, exhaust systems or specially trained personnel are required.

Chromate conversion coatings are widely accepted throughout industry as an economical means of providing corrosion protection, a good base for paint and decorative finishes for non-ferrous metals. Certain of these coatings also possess chemical polishing abilities that have luster-producing, as well as corrosion-inhibiting, effects on zinc and cadmium plate, zinc die castings and copper alloys. However, continued developments in this field have been so rapid that many manufacturers may not be completely aware of the breadth of application of this type of finish. Hence, this discussion of the many ways in which this chemical polishing characteristic can be used in final finishing or pre-plating treatments to produce a lustrous appearance with distinct display and sales appeal and appreciable savings in cost. Report I on decorative, corrosion-resistant finishes and Report II on paint base corrosion-resistant finishes are available on request.

The degree of luster possible on a surface is a function of the degree to which the surface can be smoothed. Leveling to provide a smooth surface can be achieved by mechanical or chemical means, or a combination of these, depending upon the luster desired and the original condition of the metal. Chemical polishing effectively imparts luster otherwise difficult and costly to obtain. For this reason, it is often used to supplement or entirely replace mechanical polishing, depending upon the application and the original condition of the metal. Chemical polishing has the additional advantage of providing overall treatment of the submerged part. It reaches into even the deepest corners and recesses that are otherwise inaccessible. Certain of the Iridites are specifically designed to perform this chemical polishing operation. Also, they provide corrosion protection as do all Iridites, thus may be used as a final finish or a pre-plating polish.

If Iridite is to be used as a final finish, in contrast to pre-plating treatment, the chromate conversion coating generated is allowed to remain, providing good corrosion resistance. Color inherent in these Iridite films ranges from a yellow cast to yellow iridescent. These coatings may be used without further treatment where this color is acceptable and good corrosion resistance is desired. Further, these basic coatings can be tinted by dyeing. Among the dye tints available are shades of red, yellow, blue and green. If desirable, the basic coatings can also be modified by a bleach dip leaving a clear bright or blue iridescent finish. In all cases bleaching reduces corrosion resistance.

As examples of this type of final finishing, Iridites #4-73 and #4-75 (Cast-Zinc-Brite) make possible for the first time, lustrous chemical polishing of the as-cast surface of zinc die castings. Thus, in many cases, sizeable savings in finishing cost are realized by elimination of plating costs. This economical method can be used on tools, appliance parts, toy pistols, locks and many other small castings. Another example is the treatment of copper and brass parts, such as welding tips, to eliminate buffing and provide additional corrosion resistance. In many cases, handling costs are reduced appreciably by replacing piece-part handling with bulk processing. Still another example of the use of this chemical polishing and protective quality of Iridite is a simple system of zinc plate, Iridite and clear lacquer instead of more costly electroplated finishes. Typical of this type of lustrous finish are builders hardware and wire goods.

As a pre-plating treatment, in contrast to final finishes, Iridite can be used to chemically polish zinc die castings or copper prior to plating. In such cases, Iridite should be applied as an in-process step, so that the protective film is removed before the plating cycle. The savings in handling, material and labor costs are obvious. This process has made it practical to plate chrome directly over copper on steel, conserving nickel, yet producing a lustrous chrome finish. Used after stripping faulty plate in reprocessing zinc die castings, Iridite restores luster to the casting, thus making possible replating without blistering.

Other Iridite finishes are available to produce maximum corrosion resistance, a wide variety of decorative finishes and excellent bases for paint on all commercial forms of the more commonly used non-ferrous metals. As a final finish, appearance ranges from clear bright to olive drab and brown and many films can be bleached or dyed. As a paint base Iridite provides excellent initial and retentive paint adhesion and a self-healing property which protects bare metal if exposed by scratching. Iridites have low electrical resistance. Some can be soldered and welded. The Iridite film itself does not affect the dimensional stability of close tolerance parts.

Iridites are widely approved under both Armed Services and industrial specifications because of their top performance, low cost and savings of materials and equipment.

You can see then, that with the many factors to be considered, selection of the Iridite best suited to your product demands the services of a specialist. That's why Allied maintains a staff of competent Field Engineers—to help you select the Iridite to make your installation most efficient in improving the quality of your product. You'll find your Allied Field Engineer listed under "Plating Supplies" in your classified telephone book. Or, write direct and tell us your problem. Complete literature and data, as well as sample part processing, is available. Allied Research Products, Inc., 4004-06 East Monument Street, Baltimore 5, Maryland.

Springs Mounts Simplify Installation of Heavy Equipment

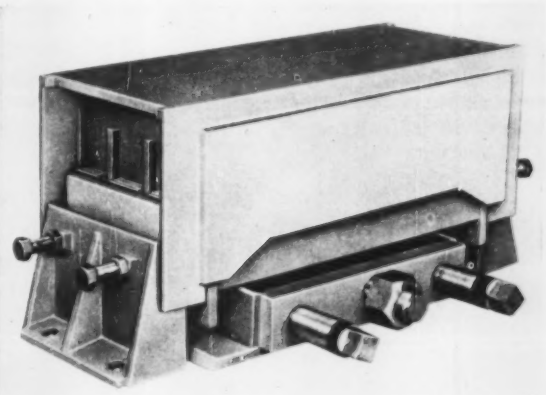
Type SW mounting is a vibration, shock, and noise isolater. It comes in seven load-carrying capacities ranging from 38,000 to 125,000 lb each.

The mounts are adjusted and leveled from the side. Shims are not needed.

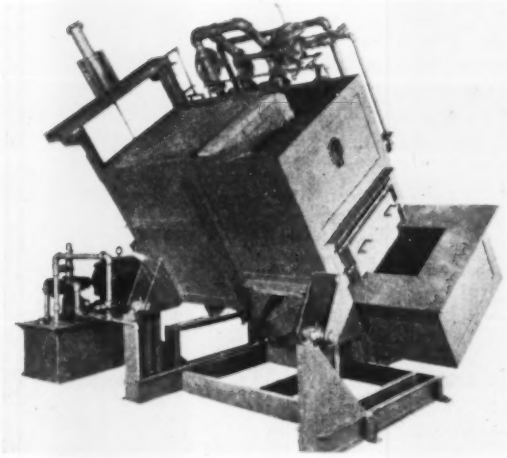
The clean, flat top of the mount permits the unit to be placed in any position under a machine base, regardless of the availability, location, or size of foundation bolt holes. Equipment weighing up to 1,000,000 lb can be installed on the mounts.

The mountings consist of welded steel housings and high carbon steel helical springs.

Resilient chocks hold upper and lower members of the housing in line. *Write*: Korfund Co. Inc., 48-40E 32nd Place, Long Island City 1, N. Y. *Phone*: Ravenswood 9-7580



Tilting Furnaces Can Melt up to 2000 lb an Hour



This line of nose pour furnaces is of the double-chamber, dry-hearth design. The larger sizes (furnaces are rated at 600, 750, 1000, and 2000 lb per hour) are usually equipped with a hydraulic tilting mechanism and can be provided with a dipout vestibule in addition to a pouring spout.

The furnaces are used for pouring large sand castings or for transferring molten metal to a holding furnace or a large ladle.

There is no gassing or overheating of metal because cold metal is never charged into the dry hearth.

All moisture is driven off while the metal is melting on the dry hearth. Moisture mixes with the products of combustion and leaves the furnace through the flue.

Melting rate and pouring temperature are controlled closely; each chamber has its own burner system. *Write*: Combustion Div., Eclipse Fuel Engineering Co., Rockford, Ill. *Phone*: 8-3751

Transfer Machine Drills, Spotfaces, Reams, Taps, and Mills

This ten-station machine processes 64 automotive crankshafts an hour.

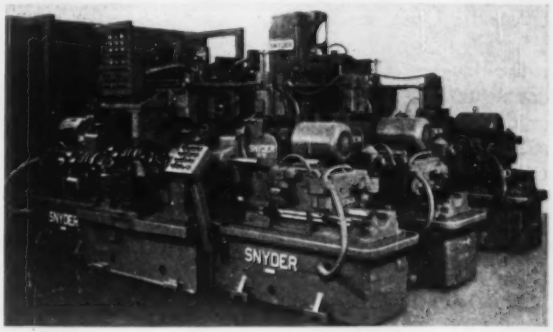
The machine is made up of three segmented machining units connected by a transfer mechanism. This design makes it easy to get at the tools and simplifies alterations when design changes are made.

Holes in the crankshaft are blown out and inspected automatically by probe-type gaging fingers. Holes are again blown out automatically after they are tapped.

Machining operations are performed by standard hydraulic-powered units which have hardened and ground ways. Four self-contained units and two way-type units are used in the machine.

A standard tapping unit having individual lead-screw drives is mounted on one end of the way-type units.

Automatic lubrication systems are provided throughout the machine. *Write*: Snyder Tool & Engineering Co., 3400 E. Lafayette, Detroit 7, Mich. *Phone*: Lorain 7-0123

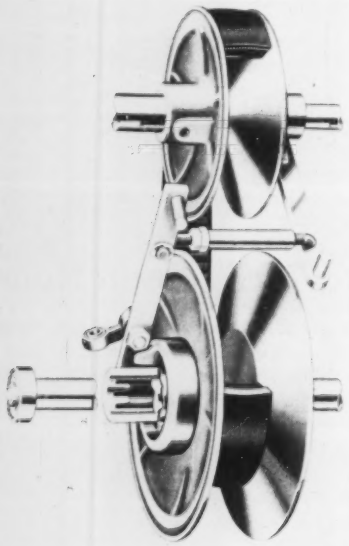


NEW PRODUCTS and equipment

Variable Speed Drive

The W line of mechanical drives provides infinitely variable speeds from 4600 to 1.2 rpm in speed variations of 2:1 to 10:1.

Speed variation is accomplished by a ribbed V-belt and a dual variable pitch pulley mounted on parallel shafts.



The units are available in integral or separate motor construction. *Write*: Sterling Electric Motors Inc., 5401 Telegraph Rd., Los Angeles 22, Calif. *Phone*: Raymond 3-6211

Strip Splicing Mill

Any ferrous or nonferrous material from 8 to 20 in. wide and from 0.060 to 0.100 in. thick can be handled by this machine. It consists of a loader, an uncoiler, a roller leveler with pinch rolls, a double up-cut shear, a wire brush unit, a welding station, and a recoiler with automatic pushoff. All units are mounted on a common base, 13 x 28 ft.

The machine weighs about 65,000 lb, and it can be broken down to sizes which permit trucking.

The shear, brush station, and welding station are carried on a sliding assembly which moves traverse to the line of the strip and is set at a 3-degree angle so that the joint is not perpendicular to

the long axis of the strip. *Write*: Berkeley-Davis Inc., 1021 Bahls St., Danville, Ill. *Phone*: 1009

Silicon Power Rectifiers

These 250-volt rectifiers are used in the operation of cranes, elevators, machine tools, magnetic chucks, and similar direct current loads.

Input ratings are available under 600 volts for three phase, 60 cycle alternating current. Direct current output ratings range from 75 to 600 kw for two-wire 250-volt systems. Ratings of three-wire 125/250-volt systems are from 75 to 150 kw.

The rectifiers will operate continuously at 100 per cent load, for 2 hours at 125 per cent load, and for 1 minute at 200 per cent load.

Conversion efficiency at full load is about 94 per cent. *Write*: General Electric Co., Schenectady 5, N. Y. *Phone*: Franklin 4-2211

Welding Cooler

This welding equipment cooler solves the heat removing problem which has restricted full utilization of the gas-shielded arc welding process.

The cooler also provides an efficient source of coolant for spot-welding dies, resistance welding rollers, induction heating coils, automatic welding equipment, and copper chill bars.

A pump draws the coolant from a 9-quart reservoir and circulates it through the welding equipment to absorb heat. Upon returning to the cooler, the liquid is passed through a three-stage radiating system.

A four-bladed, pressure type fan packs a compression chamber with air which can escape only through the radiating units.

The cooler has a maximum caloric rating of 250 Btu a minute at a room temperature of 75° F. Maximum flow rate of coolant is 1.9 quarts a minute. *Write*: Bernard Welding Equipment Co., 10232 South Ave. N, Chicago 17, Ill. *Phone*: Regent 4-1024

Roof Ventilators

These centrifugal roof ventilators come in direct-drive and belt-drive sizes.

Spun aluminum units have an unobtrusive roof-hugging appearance. Units with 7, 9, 10, 12, and 13 in. diameter centrifugal fan wheels (backwardly inclined) have direct drives. Air volume ranges from 180 to 2330 cfm.

Air volumes from 900 to 6596 cfm are provided by fans from 15 to 22 in. in diameter.

Larger units are built of steel. These belt-driven models have 24, 27, 30, 33, 36, and 40 in. diameters. Air volume ranges from 2170 to 23,427 cfm. *Write*: Trane Co., La Crosse, Wis. *Phone*: 2-8000

Sintering Muffles

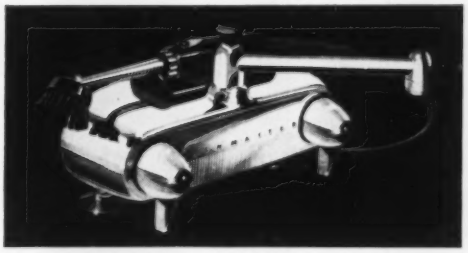
Muffles made of Inconel, Incoloy, and 330 stainless steel withstand high temperatures and strong atmospheric conditions.

Thicknesses are ¼ in. and higher. Muffles have oversize crown

FACT: *Copper and Brass . . . today's best metal bargains!*

Competitive analysis of metal costs in manufacturing "Dishmaster" dish washer device switched manufacturer back to brighter, more attractive brass and away from plated steel and other substitutes.

PROOF: *Manville Manufacturing switches back to Brass for a better product at lower cost . . . drops steel!*



Chase

BRASS & COPPER CO.

WATERBURY 20, CONNECTICUT

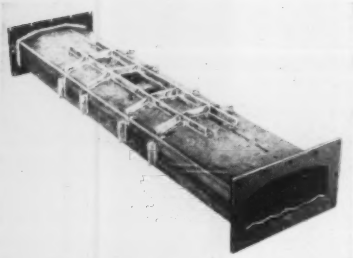
SUBSIDIARY OF KENNECOTT COPPER CORPORATION

The "Dishmaster" made by Manville Manufacturing Co. of Pontiac, Michigan, includes many small parts again being made of brass. Direct comparison of costs with cadmium-plated steel showed that brass was once again the bargain buy in metal. For example, cost of the retaining ring shown here was reduced $11.50 per thousand when the manufacturer switched back to brass! Comparable component savings are being made all down the line! (Based on October '57 costs of brass vs. steel.)

There's no excuse for using substitutes for copper and brass; the genuine article is today's best bargain in metals! Your nearest Chase man can show you specifically how Chase alloys—made of Kennecott copper—can fit into your production picture. Contact Chase locally or at Waterbury 20, Connecticut.

The Nation's Headquarters for Brass, Copper and Stainless Steel

Atlanta Baltimore Boston Charlotte Chicago Cincinnati Cleveland Dallas Denver Detroit Grand Rapids Houston Indianapolis Kansas City, Mo. Los Angeles Milwaukee Minneapolis Newark New Orleans New York (Maspeth, L. I.) Philadelphia Pittsburgh Providence Rochester St. Louis San Francisco Seattle Waterbury



tops and have high capacity to hold their shape in expansion and contraction. *Write*: Wiretex Mfg. Co. Inc., 10 Mason St., Bridgeport, Conn. *Phone*: Forest 6-3494

Cranes

The USM-C crane is made in 1, 2, and 3 ton capacity models with spans up to 30 ft.

An underhung motor drives the crane at 60 fpm. Wheels are machined and fitted with prelubricated ball bearings. All gears have cut spur teeth.

End trucks are available with all necessary parts (with the exception of the bridge beam and cross shaft) for constructing a complete crane. Bridge beams are standard I-beam sections.

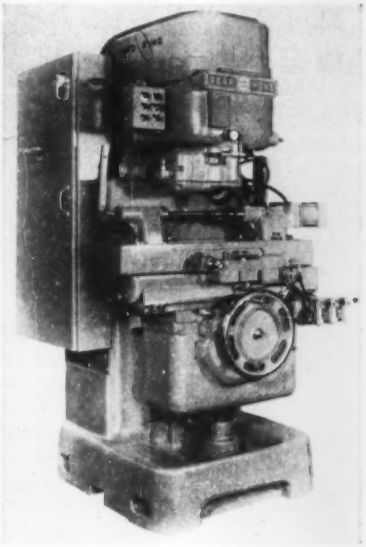
Short stub shafts with couplings are furnished as well as a drawing indicating the fabrication of the bridge beam. *Write*: Bacon Crane & Hoist Corp., 37 Division Ave., Brooklyn 11, N. Y. *Phone*: Evergreen 8-3970

Gear Honer

Model GHB is a gear tooth honing machine that provides constant pressure and zero backlash methods for honing hardened gear teeth.

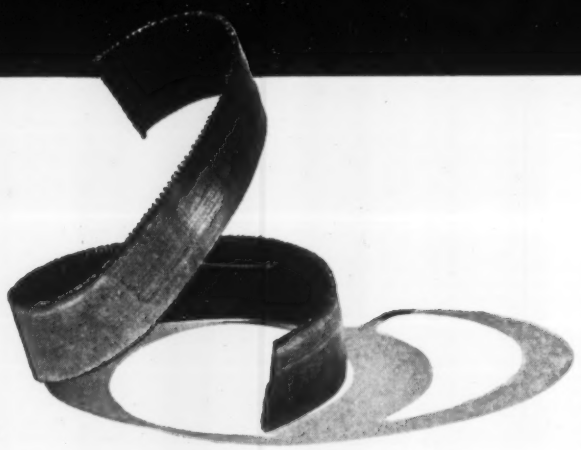
The headstock and tailstock are mounted on a tilting table which is attached to the reciprocating worktable.

Nicks and burrs are removed and surface finish improved by the constant pressure arrangement. The table is tilted down for loading. Then the work is brought into tight-mesh contact with the abrasive impregnated, gear shaped, plastic honing tool.



The zero backlash tilting table arrangement is used when more tooth shape correction is needed. In this case the work is honed in a fixed center distance relationship with the honing tool. *Write*: National Broach & Machine Co., 5600 St. Jean Ave., Detroit 13, Mich. *Phone*: Walnut 1-8980

LOOK... NO HANDS!



NEW literature

Write directly to the company for a copy

Hose and Fittings

This 4-page bulletin covers Teflon hose assemblies and industrial fittings that can be re-used. Titeflex Inc., Hendee Street, Springfield 4, Mass.

Packaging

This 24-page bulletin offers information on the planning of the shipping department and the economics in designing, testing, packing, sealing, warehousing, and shipment of corrugated boxes. Hinde & Dauch Paper Co., Sandusky, Ohio.

Dehydrators

Bulletin SC-1013, 6 pages, describes dehydrators for removing moisture from most gases continuously. Selas Corp. of America, Dresher, Pa.

Rotary Air Pumps

This 24-page bulletin includes blueprints of installations of air pumps used for vacuum and pressure operations. Leiman Bros. Inc., 102 Christie St., Newark 5, N. J.

Strap Feeder

This 4-page bulletin describes a power unit for feeding vertical straps around large packages or skid loads. Signode Steel Strapping Co., 2600 N. Western Ave., Chicago 47, Ill.

Wire Products

Iron, steel, and nonferrous wire for packaging, wire weaving, and other industries are covered in this 6-page bulletin. Riverside-Alloy Metal Div., H. K. Porter Company Inc., Riverside, N. J.

Shovel Crane

Bulletin SP-107, 16 pages, describes a self-propelled shovel crane with a capacity of ⅜ yard. Thew Shovel Co., Lorain, Ohio.

Switchgear

Bulletin 6004-C, 20 pages, describes a line of low-voltage power circuit breakers and switchboards with ratings from 225 to 4000 amp. Switchgear Div., I-T-E Circuit Breaker Co., 19th and Hamilton Streets, Philadelphia 30, Pa.

Bearing Units

Pillow blocks, flange blocks, and ball bearings are covered in a 12-page bulletin, BU-101-A. Browning Mfg. Co., Maysville, Ky.

NEW BOOKS

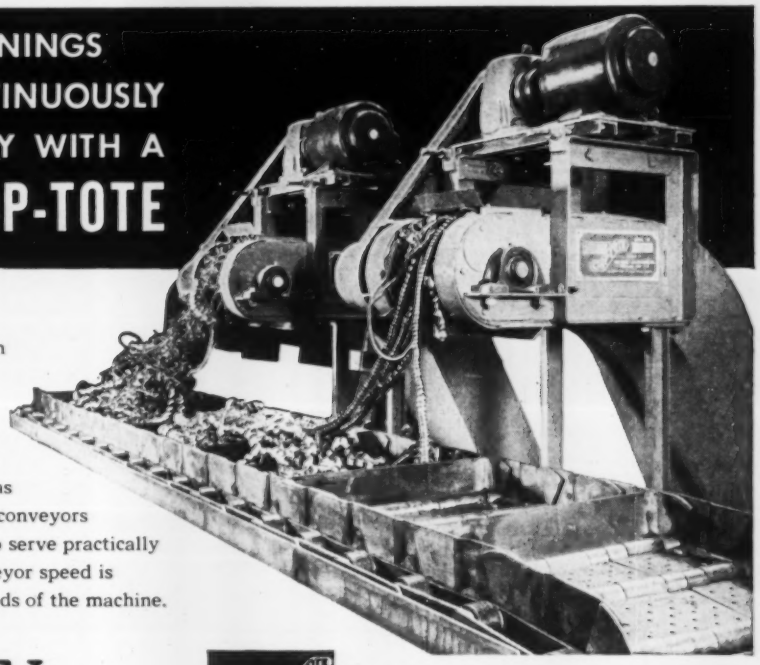
Automatic Computers; A Systems Approach for Business, Ned Chapin, D. Van Nostrand Co. Inc., 120 Alexander St., Princeton, N. J. 525 pages, $8.75.

Here are answers for the businessman, accountant, or systems engineer who wants to know what an automatic computer is, what it can do, how it works, and how it is programmed and operated. Also covered: How to determine if a computer is needed. Comparative data on available models, including costs, are included.

The Rolling of Strip, Sheet, and Plate, Eustace C. Larke, Macmillan Co., 60 Fifth Ave., New York 11, N. Y. 404 pages, $12.75.

Roll cambers, causes and control of gage variation, factors which affect the rolling load, design of rolling schedules to ensure maximum production, the calculation of roll separating forces developed during hot and cold rolling, and other aspects of the rolling process are discussed in this book.

REMOVE CHIPS, TURNINGS AND BORINGS CONTINUOUSLY AND AUTOMATICALLY WITH A MAY-FRAN CHIP-TOTE



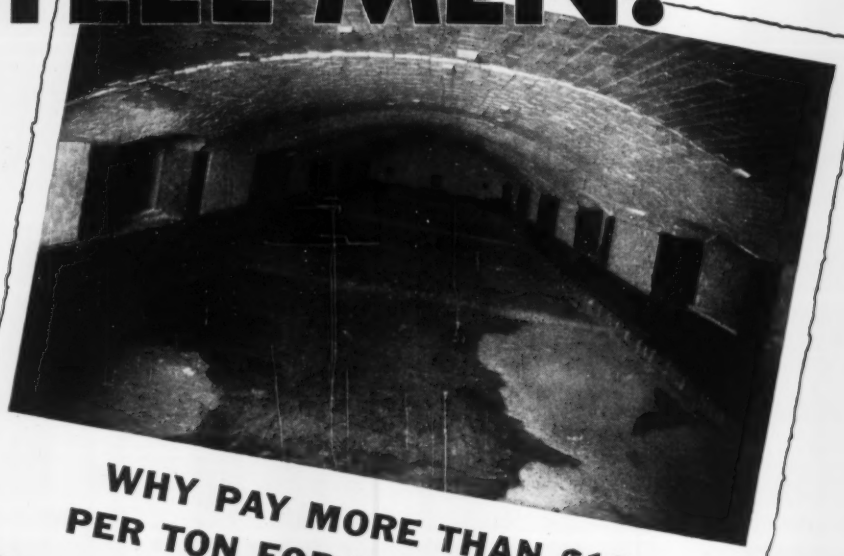
That's right! The May-Fran CHIP-TOTE permits the continuous operation of machine tools by eliminating down-time for scrap removal . . . skilled workers stay on the job . . . production increases by as much as 20%! Versatile CHIP-TOTE conveyors are available in a wide range of sizes to serve practically any type or size of machine tool. Conveyor speed is adjusted to meet the scrap removal needs of the machine.

MAY-FRAN ENGINEERING, INC.
1725 Clarkstone Rd. • Cleveland 12, Ohio

Write today for your copy of Bulletin MF-640.

7731-MF

STEEL MEN!



WHY PAY MORE THAN $12 PER TON FOR FLUX BLOCKS?

ORIGINALLY, glass tanks were built of small, fire-clay brick or sandstone blocks. No. 1 fire-brick of this type can be bought for $12 per ton. Clay flux blocks of essentially the same materials cost $60 per ton. Why pay a 500% premium simply to get *bigger pieces* of the same material?

Your reply, of course, is that the larger pieces improve furnace life by 40% to 50%—that you are willing to pay 500% more for your blocks, to get 50% greater life for your tanks. And that is true of every glass-tank owner in America today. Since you are already paying a 500% premium for a 50% return, *why is it not logical for you to buy Corhart Electrocast, at a smaller price premium over clay,* AND GET OVER 200% INCREASE IN FURNACE LIFE?

If you are looking for economy in the purchase of your tank blocks, you need pay only $12 per ton. On the other hand, if you want the lowest cost per day of tank life, or the lowest cost per ton of glass produced, you can not stop at the $12 block *or at the $60 block.*

Corhart Electrocast is the world's highest-priced refractory per ton of blocks, and the lowest-cost refractory per ton of glass produced . . . May we *prove* it to you? Write for definite facts. *Address:* Corhart Refractories Co., *Incorporated,* 16th and Lee Sts., Louisville, Ky.

CORHART ELECTROCAST REFRACTORIES

IN June, 1933, when this old ad appeared, Corhart Electrocast was still new in the glass industry. Only a few glass companies dared then to buy it, "one of the world's highest-priced refractories". But today its use is practically universal . . .

Now Corhart 104 is still new in the steel industry — but despite its high price, it offers steel furnace operators the same opportunities for greater production and lower costs that Corhart Electrocast brought to glass.

May we send you complete data? Address: Corhart Refractories Co., Incorporated, 1616 West Lee Street, Louisville, Kentucky, U.S.A., SPring 8-4471.

QUALITY ECONOMY ENDURANCE

CORHART 104 ELECTROCAST REFRACTORY

The words "Corhart" and "Electrocast" are registered Trade Marks which indicate manufacture by Corhart Refractories Company, *Incorporated.*
Corhart Refractories Co., *Incorporated,* 1600 West Lee Street,
Louisville 10, Kentucky, U.S.A.—Telephone SPring 8-4471.

STEEL
December 23, 1957

Market Outlook

STEEL and metalworking operations are tapering off as the holidays near. Ingot operations slipped another 1.5 points last week to 67.5 per cent—equal to the production of 1,725,000 net tons weekly, the smallest output since October, 1954, except for holiday and strike periods.

SLOWER RECOVERY—"Guesstimates" place holiday week ingot operations below 60 per cent, and postholiday activity is not likely to be as substantial as it has been in recent years. Reason: The production sag is more than seasonal.

GOOD SHOWING—Only a disappointing fourth quarter prevented the industry from racking up record-breaking production this year. Output through October set a ten-month high at 96,899,075 net tons. But the slump in the closing two months will bring the annual total to an estimated 113 million tons—still the third best year on record.

SLOW FIRST HALF—Sluggish markets are anticipated in the first half of 1958. Buyers, holding minimum stocks, will depend on prompt mill shipments. Around midyear an upturn in activity is predicted. Total 1958 output should be no more than 5 per cent under the 113 million tons estimated for 1957, or around 107 million tons.

JANUARY RISE—Production may go up next month, but enlarged capacity is likely to hold down operations percentagewise. Rated capacity at the start of 1958 is expected to top 141 million tons, 7 million more than the figure at the beginning of 1957.

HEAVY SHIPMENTS—Consumption during 1957 is expected to exceed mill shipments substantially, resulting in a reduction of consumers' stocks. Mill deliveries will also be heavy. Shipments in the first ten months came to 68,755,943 tons, nearly 400,000 more than the total for the like 1956 period. The record, 69,889,424 tons, was set in 1955.

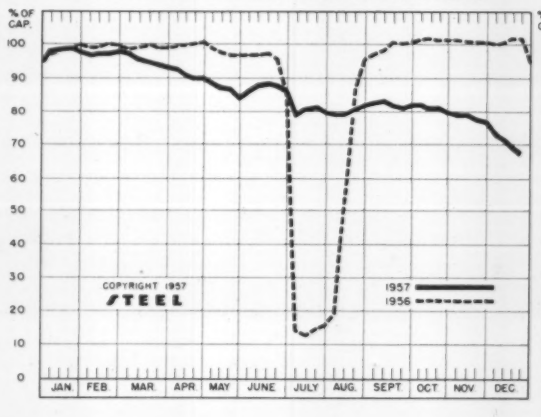
AUTOS SURPRISE—Considering recent sluggish auto demand, that industry's steel intake the first ten months of this year is surprisingly large. Its receipts were 11,793,376 tons, up from the 11,342,582 reported for the like 1956 period.

BUYER'S MARKET—A buyer's market is confirmed by relatively easy supply conditions in virtually all products, including heavy plates and structurals. Only three items are in really firm demand—wide, heavy plates; wide flange beams; and line pipe. The situation makes for increasingly sharp competition.

PRICES WATCHED—Except for easiness in quotations at the warehouse level, and disappearance of additional premium prices at mill level, no official concessions are noted. STEEL's arithmetical composite on finished steel last week dropped to $145.52 from $146.03 to reflect withdrawal of premiums on bars and plates.

SCRAP FIRMER—After a long, steady decline, the scrap market last week appeared to be developing a firmer tone. STEEL's composite on the prime steelmaking grade rose $1.17 to $33.17, as result of a sharp increase in the East. It is the first rise registered since the end of last July.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

	Week Ended Dec. 22	Change	Same Week 1956	Same Week 1955
Pittsburgh	63	— 4*	103	99
Chicago	74.5	— 0.5*	103.5	98.5
Mid-Atlantic	81	0	102	98
Youngstown	63	— 2	104	95
Wheeling	61	— 0.5	100	98
Cleveland	69	+ 1*	104.5	93.5
Buffalo	63.5	0	107.5	100
Birmingham	71	+ 4	94	94.5
New England	52	0	74	92
Cincinnati	68.5	— 4	90.5	92.5
St. Louis	75.5	+ 15	90.5	100
Detroit	80.5	—11*	99	95
Western	77	— 3	102	108
National Rate	67.5	— 1.5	102	98

INGOT PRODUCTION‡

	Week Ended Dec. 22	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)	108.3†	110.2	121.1	157.2
NET TONS (In thousands)	1,739†	1,770	1,945	2,525

*Change from preceding week's revised rate. †Estimated. ‡American Iron & Steel Institute. Weekly capacity (net tons): 2,559,490 in 1957; 2,461,893 in 1956; 2,413,278 in 1955.

Metalworking Outlook—Page 29 Technical Outlook—Page 65

Air Force officials for a long time have considered the width of stainless and alloy sheets (above right) as a limiting factor in aircraft design. U. S. Steel Corp. may have come up with the answer to their prayers with its . . .

King-Size Sheets on Way

ALLOY AND STAINLESS sheets in thin gages and widths up to 90 in. soon may be available to the aircraft and missile industries. They're the result of research in "sandwich" rolling at U. S. Steel Corp.'s Homestead District Works.

"The research and development project marks a major breakthrough in the size barrier and holds promise of better mill-produced materials for planes and missiles," say corporation officials. Where aircraft requirements call for alloy and stainless steel sheets wider than now available (the standard width is 48 in.), two or more sheets must be welded together, adding to the weight of the design. The wider sheet offers a significant saving in weight, plus simplification of design and fabrication.

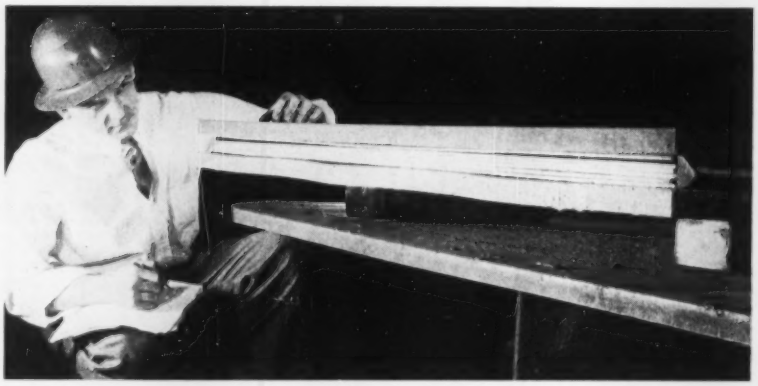
How It's Done—The process was developed by Howard S. Orr, project development engineer for USS. A typical sandwich consists of two ordinary carbon steel cover plates —each is 1 in. thick. Four plates of 12 per cent stainless (or other alloy steel), each 5/16 in. thick, are placed between the covers. The plates are coated with a separating compound to prevent them from fusing during the rolling.

The sandwich, about 3 in. thick, is held together with welded-in side and end bars. It is heated by conventional methods and rolled down to a plate $\frac{3}{8}$ in. thick, 100 in. wide, and 250 in. long. After the side and end bars are cut off, and the cover is lifted, the product is a sheet similar to the one at the left in the top photo—90 in. wide and 250 in. long.

Each layer of the sandwich is uniformly reduced about 90 per cent; the original 5/16-in. stainless plates end up with a nominal thickness of 0.033 in. Until now, it has not been feasible to get such width in such a thin gage, U. S. Steel officials declare.

Problems Solved—Under normal procedures, such king-size sheets are difficult to roll because heat loss is too great and too much power is required. Because of its initial thickness, the sandwich tends to retain sufficient heat for the entire rolling operation. In addition, it has the working qualities of the carbon steel cover plates instead of the stainless or alloy plates inside.

This minimizes the need for excessive rolling mill power requirements. The experiments at the Homestead mill have been carried on with existing facilities, although corporation officials say that engineering studies must be made



Several cuts of stainless steel plates make up the meat of this sandwich between two slices of ordinary carbon steel plates. The sides and ends are welded to hold the stack together, heated, and then rolled in the same manner as any other carbon plates would be. The result: 90-in. wide, thin gage stainless sheets

to determine the additional equipment needed to put the process into production. Studies are also being conducted to determine the best sandwich design and assembly methods, as well as to develop suitable ways to heat treat, quench, flatten, and finish the sheets to meet the exacting requirements of the aircraft and missile industry.

Stainless Steel . . .

Stainless Steel Prices, Page 104

Demand for stainless steel bars is soft in the Detroit market. One area supplier says orders for December are down probably 20 per cent from those booked in November. This maker thinks business will improve a little in the first quarter, but that January orders so far haven't confirmed this view. December looks like the lowest month for this producer. Deliveries average about three to four weeks, but ten-day shipments can be had.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 99 & 100

Sheet suppliers say auto builders have not made known their full requirements for the first two months of 1958. Public reaction to the 1958 model cars has not been clearly demonstrated.

Several motor car interests are expected to cut schedules in January. At the same time, general metalworking is slowing down. Sheet and strip buyers generally are holding their inventories at the lowest possible level. Since they can get prompt mill deliveries, they see little point in stocking heavily.

Eastern sellers report January bookings are dragging. Most area mills do not expect orders next month will exceed low December volume by more than 10 per cent. Stocks are being worked off at a slow pace because of slackened operations in household equipment and automotive fields.

Some forward buying of electrical grade coils is noted in New England. Some users have covered first quarter needs. A spurt in demand for 430 stainless sheets is subsiding. Grain-oriented silicon sheet sales are off.

Raritan Arsenal, Metuchen, N. J., will close Dec. 26 on 375 tons of pickled and oiled hot-rolled carbon sheets.

Steel Bars . . .

Bar Prices, Page 98

Curtailed manufacturing operations and substantial inventories are reflected in sluggish demand for steel bars, both carbon and alloy. Hot-rolled suppliers see no immediate change in prospects, but they are hoping for a moderate pickup in sales next month.

Cold-drawn barmakers do not anticipate much improvement in their sales volume soon. Their sales were poor this month. This sluggishness at the converter level is reflected in hot bar demand.

Mill schedules will fall well short of capacity next month, and prompt shipments will be available. This is discouraging forward buying. Order volume could pick up substantially without an extension

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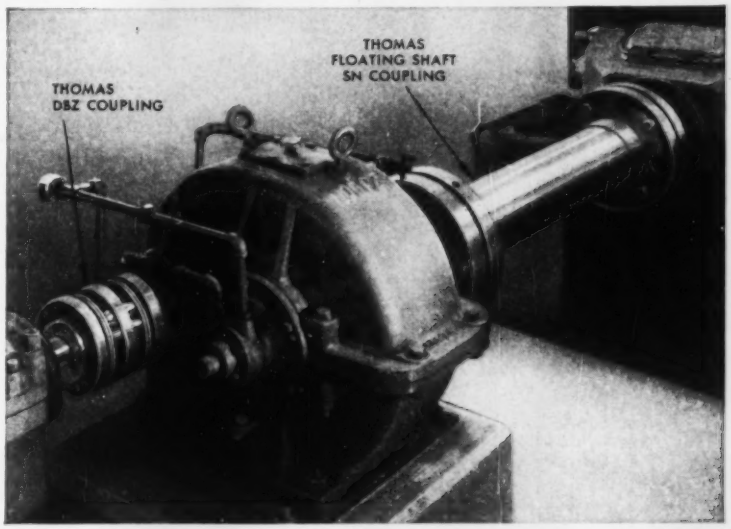

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in deliveries because of producers substantial banks of semifinished steel.

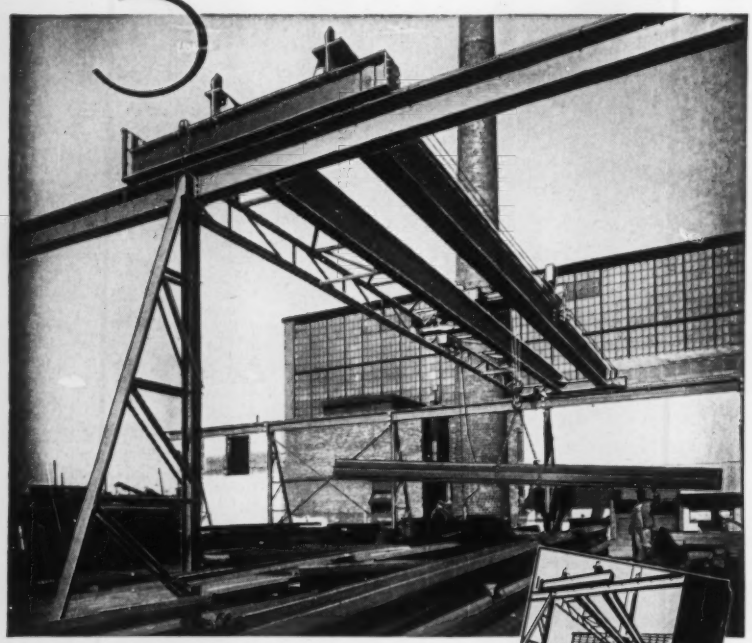
Reinforcing Bars . . .

Reinforcing Bar Prices, Page 98

Prices of concrete reinforcing steel bars are easing with demand-supply balance prevailing at most distributing points. In the East, the bulk of tonnage is subject to price pressure. Contractors in that area still estimate 14.00 cents to 15.00 cents per pound in place, but in many cases, they are able to buy deformed and fabricated stock at half that price.

With sizable bar backlogs, Oregon Steel Mills plans to suspend operations three day over Christmas and three days over New Year. Northwest Steel Rolling Mills Inc., Seattle, will be down two weeks. Considerable reinforcing tonnage is involved in highway projects in Oregon and Washington, but recent placements have been small.

3 reasons why...



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Wire . . .

Wire Prices, Pages 100 & 103

Yearend operations will be curtailed more than they were last year by the wire mills and their customers. Wiremakers' backlogs are low, and the bulk of volume placed is for prompt shipment of fill-in tonnages.

Bookings for January are light—and notably for rods. There is some first quarter buying of high carbon specialties; inventories of some eastern consumers are expected to be depleted by Jan. 1. These consumers bought sparingly for fourth quarter and indicate replacement tonnage will be needed in the first quarter of 1958. While this volume will be placed in January, in some cases shipment is not wanted until February-March.

Automotive demand continues slow, and unless car sales gain, a drop in ordering is expected next month.

Merchant wire sales continue limited, especially in the East and several other areas where foreign competition is severe. Demand from the construction industry is off seasonally.

Plates . . .

Plate Prices, Page 98

Eastern plate mills expect to have full January schedules although tonnage specifications are coming through with less pressure. Makers are becoming current on practically all gages, with leading consumers cutting needs—notably for tanks, pressure vessels, weldments, and miscellaneous heavy equipment, including construction machinery.

Shipbuilding requirements are mounting, with demand stronger for heavier, higher manganese-lower carbon plates for supertankers. The ships are to be double plated in critical stress areas.

In some cases, mills are booked into mid-February on alloy plates. Clad plate deliveries are down to six-eight weeks, heads four to five. Some mills are booking plate girder bridge tonnage direct.

The last of the premium prices has officially disappeared, with the Harrisburg, Pa., mill now quoting $5.10 per 100 lb, mill, on carbon plates.

Steel Shipments Heavy

Mill shipments of finished steel products totaled 69,155,531 net tons in the first ten months of 1957, reports the American Iron & Steel Institute. The figure was nearly 400,000 tons greater than the 68,755,943 tons moved in the like period of 1956. It compares with the record 69,889,434 tons shipped in January through October, 1955.

Principal market groups were:

Classification:	Net Tons 10 Mo. 1957	% of Domestic Shipments
Warehouses	12,836,698	19.7
Automotive	11,793,376	18.1
Construction	10,698,821	16.4
Containers	5,592,026	8.6
Machinery	3,946,455	6.0
Railroads	3,689,897	5.7

Particularly significant is the fact that shipments to the automotive, construction, and the railroad classifications ran ahead of the ten-month totals in 1956. Construction received more in the period than it did all last year (10.4 million tons).

Products shipped in the greatest tonnage were:

Products	Net Tons 10 Mo. 1957
Cold-rolled sheets	9,944,292
Plates	8,150,346
Hot-rolled sheets	6,693,443
Hot-rolled bars	6,574,834
Structurals	5,758,220
Elec. tin plate	4,205,356

Plate, structural, and electrolytic tin plate shipments were running at better than the 1956 total. Structurals set a ten-month high mark.

During October, total shipments of finished products amounted to 6,550,690 net tons, compared with 6,171,674 in September, and with 7,930,957 in October, 1956.

Ferroalloys . . .

Ferroalloy Prices, Page 107

Production of silicon alloys and metal during the third quarter was 11 per cent below output in the second quarter, reports the U. S. Bureau of Mines. Shipments from furnaces were 2 per cent higher, and apparent consumption (shipments plus imports, minus exports) was about 4 per cent lower.

Stocks on hand at producers plants as of Sept. 30 totaled 140,827 short tons, compared with 152,056 on June 30. Here are U. S. statistics on silvery pig iron, ferrosilicon, silicon briquets, silicon metal, and miscellaneous silicon alloys (short tons are used):

Year	Domestic Furnace Shipments	Imports	Exports	Apparent Consumption
1954	632,505	17,811	2,080	648,236
1955	933,063	24,359	1,689	955,733
1956	865,953	22,017	2,114	885,856
1957				
First Quarter	201,577	4,945	757	205,765
Second Quarter	197,325	5,931	812	202,444
Third Quarter	189,721	5,568	251	195,038
Total 9 Mo.	588,623	16,444	1,820	603,247

	Production		Shipments	
	1957 3rd Quar.	1957 2nd Quar.	1957 3rd Quar.	1957 2nd Quar.
Blast furnaces (Silvery Iron)	35,979	55,056	40,566	43,763
Electric Furnaces (Ferrosilicon)	130,500	137,899	136,055	132,850
Silicon Metal, and Other Silicon Alloys	23,242	20,901	24,532	20,712
Totals	189,721	213,856	201,153	197,325

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Steel Ingot Production—November, 1957

Period	— OPEN HEARTH — Net tons	Per cent of capacity	—BESSEMER— Net tons	Per cent of capacity	—ELECTRIC— Net tons	Per cent of capacity	—TOTAL— Net tons	Per cent of capacity
1957								
January ..	9,829,691	99.0	294,839	77.1	884,232	86.5	11,008,762	97.1
February .	8,898,671	99.2	277,682	80.4	810,853	87.8	9,987,206	97.6
March	9,442,164	95.1	275,156	71.9	871,754	85.2	10,589,074	93.4
1st Qtr. ..	28,170,526	97.7	847,677	76.3	2,566,839	86.4	31,585,042	96.0
April	8,820,328	91.8	231,731	62.6	762,721	77.1	9,814,780	89.5
May	8,842,707	89.1	201,864	52.8	747,752	73.1	9,792,323	86.4
June	8,498,903	88.4	210,915	57.0	681,584	68.9	9,391,402	85.6
2nd Qtr. ..	26,161,938	89.8	644,510	57.4	2,192,057	73.0	28,998,505	87.2
1st 6 Mo..	54,332,464	93.7	1,492,187	66.8	4,758,896	79.7	60,583,547	91.5
July	8,086,519	81.4	194,638	50.9	627,575	61.4	8,908,732	78.6
August ...	8,297,172	83.6	204,723	53.5	731,995	71.6	9,233,890	81.5
September..	8,135,139	84.7	185,967	50.2	656,800	66.4	8,977,906	81.8
3rd Qtr. ..	24,518,830	83.2	585,328	51.5	2,016,370	66.4	27,120,528	80.6
9 Mo. ...	78,851,294	90.2	2,077,515	61.7	6,775,266	75.2	87,704,075	87.9
*October..	8,348,522	84.1	154,577	40.4	694,618	67.9	9,197,717	81.1
†November..	7,674,000	79.9	135,000	36.5	584,000	59.0	8,393,000	76.5
1956								
January ..	9,676,151	101.4	323,235	79.5	828,845	86.7	10,828,231	99.3
February .	9,043,064	101.3	296,543	78.0	799,388	87.1	10,118,995	99.2
March	9,795,263	102.7	310,060	76.3	819,465	85.7	10,924,788	100.2
1st Qtr. ..	28,514,478	101.8	929,838	77.9	2,427,698	86.5	31,872,014	99.6
April	9,437,945	102.2	306,388	77.9	779,452	84.2	10,523,785	99.7
May	9,370,167	98.2	297,990	73.3	822,219	86.0	10,490,376	96.2
June	8,664,605	93.9	282,846	71.9	773,546	83.6	9,720,997	92.1
2nd Qtr. ..	27,472,717	98.1	887,224	74.3	2,375,217	84.6	30,735,158	96.0
1st 6 Mo. .	55,987,195	100.0	1,817,062	76.1	4,802,915	85.6	62,607,172	97.8
July	1,330,151	13.9	.....	....	292,012	30.5	1,622,163	14.9
August ...	7,213,274	75.6	189,564	46.6	719,759	75.3	8,122,597	74.5
September..	9,342,796	101.2	286,978	72.9	792,885	85.7	10,422,659	98.8
3rd Qtr. ..	17,886,221	63.2	476,542	39.5	1,804,656	63.6	20,167,419	62.3
9 Mo.	73,873,416	87.6	2,293,604	63.8	6,607,571	78.2	82,774,591	85.9
October ...	9,841,002	103.2	330,101	81.2	877,410	91.8	11,048,513	101.3
November..	9,430,248	102.2	295,827	75.2	829,425	89.6	10,555,500	100.0
December .	9,695,919	101.6	308,465	75.9	833,161	87.1	10,837,545	99.4
4th Qtr. ..	28,967,169	102.3	934,393	77.4	2,539,996	89.5	32,441,558	100.3
2nd 6 Mo..	46,853,390	82.8	1,410,935	58.5	4,344,652	76.5	52,608,977	81.3
Total 1956	102,840,585	91.6	3,227,997	67.4	9,147,567	81.2	115,216,149	89.8

Note—The percentages of capacity operated in 1957 are calculated on Jan. 1, 1957, annual capacities of: Open hearth, 116,912,410 net tons; bessemer, 4,505,000 net tons; electric, 12,041,740 net tons; total, 133,459,150 net tons. The percentages of capacity operated in 1956 are calculated on Jan. 1, 1956, annual capacities of: Open hearth, 112,317,040 net tons; bessemer, 4,787,000 net tons; electric, 11,259,050 net tons; total, 128,363,090 net tons.
*Revised. †Preliminary figures, subject to revision.

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Deformed Bars (⅝" Dia. incl. all extras)	$5.93	$6.18	$6.12	$5.76
Merchant Bars (¼" Round incl. all extras)...	7.05	7.29	6.65	6.28
Bands (1"x¼"x20' incl. all extras)	7.76	7.98	7.65	7.38
Angles (2"x2"x¼" incl. all extras)	5.98	6.23	6.46	6.10
Beams & Channels (base)	6.43	6.66	6.92	6.56
Furring Channels (C.R. ¾", per 1000')	26.67	27.36	....	....
Barbed Wire (per 82 lb. net reel)	6.95	7.40	7.75	7.80
Nails (bright, common, 20d and heavier)	8.12	8.32	8.97	8.79
Larssen Sheet Piling (section II, new, incl. size extra)	7.80	8.10	8.10	7.80
Wire, Manufacturer's bright, low C, (11½ ga.)	7.15	7.29	8.29	8.29
Wire, galv., Fence qual., low C, (11½ ga.) ..	7.68	7.82	9.09	9.09
Wire, Merchant quality, bl. ann., (10 ga.) ...	7.27	7.42	8.45	8.45
Rope Wire (.045", 247,000 PSI, incl. extras)..	13.60	13.75	13.00	13.00
Wire, fine and weaving, low C, (20 ga.)	10.66	10.80	10.17	12.17
Tie Wire, autom. baler (14½ ASWG, 97 lbs. net)	9.58	9.73	9.64	9.54
Merchant Pipe (½" galv. T & C. per 100')...	8.48	8.83	....	....
Casing (5½", 15.5 J55, T & C, per 100')	189.00	194.00	....	....
Tubing (2⅞", 6.4 J55, EUE, per 100')	98.00	99.00	....	....
Forged R Turn. Bars, C-1035 (from 10" dl.).	13.50	13.73	13.50	13.24

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Rails, Cars . . .

Track Material Prices, Page 103

While announcements of new rail orders are lacking, indications are that the railroads are again ordering tonnage. U. S. Steel Corp.'s Tennessee Coal & Iron Div., Birmingham, has reopened its rail mill which was closed down Oct. 1. The 400 workmen who were laid off then have been recalled. The division also is increasing steel ingot production, having reactivated an idle open hearth furnace.

Semifinished Steel . . .

Semifinished Prices, Page 98

Inland Steel Co. completed rebuilding the first of seven open hearths and returned it to production early this month. The second furnace was restarted last week, and the third is scheduled for its first heat around New Year's Day.

With resumption of these furnaces, the remaining four will go down for rebuilding. The rebuilding program started Aug. 5.

Steel Output Imposing

Production of ingots and steel for castings totaled 105,294,792 net tons in the first 11 months of this year, reports the American Iron & Steel Institute. In only one other comparable period was that total exceeded; in 1955, output amounted to 106.5 million tons.

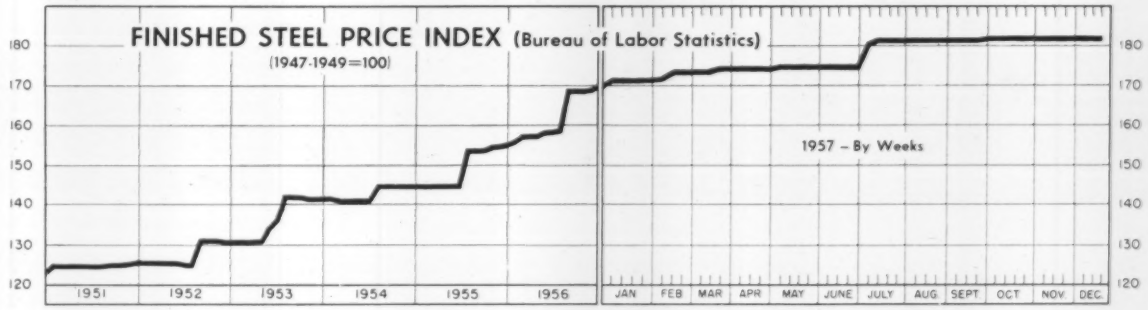
In 1956, the 11-month total was 104.4 million tons, about 900,000 less than in the like period this year. But production was held down during 1956 by a five-week strike.

In terms of the basic index of average production for the period 1947-49, output in the January-November period was 137.4. During the comparable period last year, the index was 135.8.

November output was estimated at 8,393,000 tons. The index for the month was 121.9. In October, production totaled 9,197,717 tons. In November, 1956, it was 10,555,500.

Through November, the industry operated at 86.2 per cent of capacity, based on the Jan. 1, 1957, capacity rating of 133,459,150 net tons. During November, it operated at 76.5 per cent.

Price Indexes and Composites



Dec. 17 1957	Week Ago	Month Ago	Nov. Avg.	Year Ago
181.7	181.7	181.7	181.7	168.8

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Endede Dec. 17

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.600	Bars, Reinforcing	6.210
Rails, Light, 40 lb	7.067	Bars, C.F., Carbon	10.360
Tie Plates	6.600	Bars, C.F., Alloy	13.875
Axles, Railway	9.825	Bars, C.F., Stainless, 302 (lb)	0.553
Wheels, Freight Car, 33 in. (per wheel)	60.000	Sheets, H.R., Carbon	6.192
Plates, Carbon	6.150	Sheets, C.R., Carbon	7.089
Structural Shapes	5.942	Sheets, Galvanized	8.220
Bars, Tool Steel, Carbon (lb)	0.535	Sheets, C.R., Stainless, 302 (lb)	0.688
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.650	Sheets, Electrical	12.025
Bars, Tool Steel, H.R., Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.355	Strip, C.R., Carbon	9.243
Bars, Tool Steel, H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.850	Strip, C.R., Stainless, 430 (lb)	0.493
Bars, H.R., Alloy	10.525	Strip, H.R., Carbon	6.245
Bars, H.R., Stainless, 303 (lb)	0.525	Pipe, Black, Buttweld (100 ft)	19.814
Bars, H.R., Carbon	6.425	Pipe, Galv., Buttweld (100 ft)	23.264
		Pipe, Line (100 ft)	199.023
		Casing, Oil Well, Carbon (100 ft)	194.499
		Casing, Oil Well, Alloy (100 ft)	304.610
Tubes, Boiler (100 ft)	49.130	Black Plate, Canmaking Quality (95 lb base box)	7.583
Tubing, Mechanical, Carbon (100 ft)	24.953	Wire, Drawn, Carbon	10.225
Tubing, Mechanical, Stainless, 304 (100 ft)	205.608	Wire, Drawn, Stainless, 430 (lb)	0.653
Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	9.783	Bale Ties (bundles)	7.967
Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.483	Nails, Wire, 8d Common	9.828
		Wire, Barbed (80-rod spool)	8.719
		Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	Dec. 18 1957	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	239.15	239.15	239.15	225.92	181.31
Index in cents per lb	6.479	6.479	6.479	6.111	4.912

STEEL's ARITHMETICAL PRICE COMPOSITES*

Finished Steel, NT	$145.42	$146.03	$146.03	$137.66	$110.98
No. 2 Fdry Pig Iron, GT	66.49	66.49	66.49	62.63	55.04
Basic Pig Iron, GT	65.99	65.99	65.99	62.18	54.66
Malleable Pig Iron, GT	67.27	67.27	67.27	63.41	55.77
Steelmaking Scrap, GT	33.17	32.00	33.17	64.83	43.00

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Dec. 18 1957	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.425	5.425	5.425	5.075	3.95
Bars, H.R., Chicago	5.425	5.425	5.425	5.075	3.95
Bars, H.R., deld., Philadelphia	5.725	5.725	5.725	5.35	4.502
Bars, C.F., Pittsburgh	7.30*	7.30*	7.30*	6.85*	4.925
Shapes, Std., Pittsburgh	5.275	5.275	5.275	5.00	3.85
Shapes, Std., Chicago	5.275	5.275	5.275	5.00	3.85
Shapes, deld., Philadelphia	5.545	5.545	5.545	5.40	4.13
Plates, Pittsburgh	5.10	5.10	5.10	4.85	3.90
Plates, Chicago	5.10	5.10	5.10	4.85	3.90
Plates, Coatesville, Pa.	5.10	5.10	5.10	5.25	4.35
Plates, Sparrows Point, Md.	5.10	5.10	5.10	4.85	3.90
Plates, Claymont, Del.	5.70	5.70	5.70	5.35	4.35
Sheets, H.R., Pittsburgh	4.925	4.925	4.925	4.675	3.775
Sheets, H.R., Chicago	4.925	4.925	4.925	4.675	3.775
Sheets, C.R., Pittsburgh	6.05	6.05	6.05	5.75	4.575
Sheets, C.R., Chicago	6.05	6.05	6.05	5.75	4.575
Sheets, C.R., Detroit	6.05-6.15	6.05-6.15	6.05-6.15	5.75-5.85	4.775
Sheets, Galv., Pittsburgh	6.60	6.60	6.60	6.30	5.075
Strip, H.R., Pittsburgh	4.925	4.925	4.925	4.675	3.75-4.225
Strip, H.R., Chicago	4.925	4.925	4.925	4.675	3.725
Strip, C.R., Pittsburgh	7.15	7.15	7.15	6.85	5.10-5.80
Strip, C.R., Chicago	7.15	7.15	7.15	6.85	5.35
Strip, C.R., Detroit	7.25	7.25	7.25	6.95	5.30-6.05
Wire, Basic, Pittsburgh	7.65	7.65	7.65	7.20	5.10-5.225
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.20	6.20-6.35
Tin plate (1.50 lb) box, Pitts.	$10.30	$10.30	$10.30	$9.95	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL

Billets, forging, Pitts. (NT)	$96.00	$96.00	$96.00	$91.50	$70.50
Wire rods, 1/2-9/32" Pitts.	6.15	6.15	6.15	5.80	4.425

PIG IRON, Gross Ton	Dec. 18 1957	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts.	$67.00	$67.00	$67.00	$63.50	$55.50
Basic, Valley	66.00	66.00	66.00	62.50	54.50
Basic, deld., Phila.	70.01	70.01	70.01	66.26	59.25
No. 2 Fdry, Neville Island, Pa.	66.50	66.50	66.50	63.00	55.00
No. 2 Fdry, Chicago	66.50	66.50	66.50	63.00	55.00
No. 2 Fdry, deld., Phila.	70.51	70.51	70.51	66.76	59.75
No. 2 Fdry, Birm.	62.50	62.50	62.50	59.00	51.38
No. 2 Fdry (Birm.) deld. Cin.	70.20	70.20	70.20	66.70	58.93
Malleable, Valley	66.50	66.50	66.50	63.00	55.00
Malleable, Chicago	66.50	66.50	66.50	63.00	55.00
Ferromanganese, Duquesne	245.00†	245.00†	245.00†	235.00†	228.00*

†74-76% Mn, net ton. *75-82% Mn, gross ton, Etna, Pa.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pittsburgh	$31.50	$31.50	$33.50	$66.50	$44.00
No. 1 Heavy Melt, E. Pa.	37.00	33.50	33.50	63.00	41.50
No. 1 Heavy Melt, Chicago	31.00	31.00	32.50	65.00	42.50
No. 1 Heavy Melt, Valley	29.50	29.50	31.50	66.50	44.00
No. 1 Heavy Melt, Cleve.	26.50	26.50	28.50	65.00	43.00
No. 1 Heavy Melt, Buffalo	31.50	31.50	32.50	62.50	43.00
Rails, Rerolling, Chicago	49.50	47.50	48.50	89.50	52.50
No. 1 Cast, Chicago	37.50	35.50	35.50	50.50	50.00

COKE, Net Ton

Beehive, Furn., Connlsvl.	$15.25	$15.25	$15.25	$14.50	$14.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	17.50	17.00

Steel Prices

Mill prices as reported to STEEL, Dec. 18, cents per pound except as otherwise noted. *Changes shown in italics.* Code numbers following mill points indicate producing company. Key to producers, page 99; to footnotes, page 103.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 ....$73.50

INGOTS, Alloy (NT)
Detroit S41 ....$77.00
Farrell,Pa. S3 ....77.00
Lowellville,O. S3 ....77.00
Midland,Pa. C18 ....77.00
Munhall,Pa. U5 ....77.00
Sharon,Pa. S3 ....77.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ....$77.50
Buffalo R2 ....77.50
Clairton,Pa. U5 ....77.50
Ensley,Ala. T2 ....77.50
Fairfield,Ala. T2 ....77.50
Fontana,Calif. K1 ....88.00
Gary,Ind. U5 ....77.50
Johnstown,Pa. B3 ....77.50
Lackawanna,N.Y. B2 ..77.50
Munhall,Pa. U5 ....77.50
S.Chicago,Ill. R2, U5 ..77.50
S.Duquesne,Pa. U5 ....77.50
Sterling,Ill. N15 ....77.50
Youngstown R2 ....77.50

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$96.00
Buffalo R2 ....96.00
Canton,O. R2 ....98.50
Clairton,Pa. U5 ....96.00
Conshohocken,Pa. A3 ..101.00
Ensley,Ala. T2 ....96.00
Fairfield,Ala. T2 ....96.00
Fontana,Calif. K1 ....105.50
Gary,Ind. U5 ....96.00
Geneva,Utah C11 ....96.00
Houston S5 ....101.00
Johnstown,Pa. B2 ....96.00
Lackawanna,N.Y. B2 ..96.00
LosAngeles B3 ....105.50
Midland,Pa. C18 ....96.00
Munhall,Pa. U5 ....96.00
Seattle B3 ....109.50
Sharon,Pa. S3 ....96.00
S.Chicago R2, U5, W14 ..96.00
S.Duquesne,Pa. U5 ....96.00
S.SanFrancisco B3 ....105.50
Warren,O. C17 ....96.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ..$114.00
Bridgeport,Conn. C32 ..114.00
Buffalo R2 ....114.00
Canton,O. R2, T7 ....114.00
Conshohocken,Pa. A3 ..121.00
Detroit S41 ....114.00
Economy,Pa. B14 ....114.00
Farrell,Pa. S3 ....114.00
Fontana,Calif. K1 ....135.00
Gary,Ind. U5 ....114.00
Houston S5 ....119.00
Ind.Harbor,Ind. Y1 ..114.00
Johnstown,Pa. B2 ....114.00
Lackawanna,N.Y. B2 ..114.00
Los Angeles B3 ....134.00
Lowellville,O. S3 ....114.00
Massillon,O. R2 ....114.00
Midland,Pa. C18 ....114.00
Munhall,Pa. U5 ....114.00
Sharon,Pa. S3 ....114.00
S.Chicago R2,U5,W14 ..114.00
S.Duquesne,Pa. U5 ..114.00
Struthers,O.Y1 ....114.00
Warren,O. C17 ....114.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 ....$117.50
Canton,O. R2 ....120.00
Cleveland R2 ....117.50
Gary,Ind. U5 ....117.50
S.Chicago,Ill. R2, W14 117.50
S.Duquesne,Pa. U5 ..117.50
Warren,O. C17 ....117.50

SKELP
Aliquippa,Pa. J5 ....5.075
Munhall,Pa. U5 ....4.875
Warren,O. R2 ....4.875
Youngstown R2, U5 ..4.875

WIRE RODS
AlabamaCity,Ala. R2 ..6.15
Aliquippa,Pa. J5 ....6.15
Alton,Ill. L1 ....6.35
Buffalo W12 ....6.15
Cleveland A7 ....6.15
Donora,Pa. A7 ....6.15
Fairfield,Ala. T2 ....6.15
Houston S5 ....6.40
IndianaHarbor,Ind. Y1 ..6.15
Johnstown,Pa. B2 ....6.15
Joliet,Ill. A7 ....6.15
KansasCity,Mo. S5 ....6.40
Kokomo,Ind. C16 ....6.25
LosAngeles B3 ....6.95
Minnequa,Colo. C10 ....6.40
Monessen,Pa. P7 ....6.15
N.Tonawanda,N.Y. B11 ..6.15
Pittsburg,Calif. C11 ....6.95
Portsmouth,O. P12 ....6.15
Roebling,N.J. R5 ....6.25
S.Chicago,Ill. R2 ....6.15
SparrowsPoint,Md. B2 ..6.25
Sterling,Ill. (1) N15 ....6.15
Sterling,Ill. N15 ....6.25
Struthers,O. Y1 ....6.15
Worcester,Mass. A7 ....6.45

STRUCTURALS

Carbon Steel Std. Shapes
Ala.City,Ala. R2 ....5.275
Atlanta A11 ....5.475
Aliquippa,Pa. J5 ....5.275
Bessemer,Ala. T2 ....5.275
Bethlehem,Pa. B2 ....5.325
Birmingham C15 ....5.275
Clairton,Pa. U5 ....5.275
Fairfield,Ala. T2 ....5.275
Fontana,Calif. K1 ....6.075
Gary,Ind. U5 ....5.275
Geneva,Utah C11 ....5.275
Houston S5 ....5.375
Ind.Harbor,Ind. I-2 ....5.275
Johnstown,Pa. B2 ....5.325
Joliet,Ill. P22 ....5.275
KansasCity,Mo. S5 ....5.375
Lackawanna,N.Y. B2 ..5.325
LosAngeles B3 ....5.975
Minnequa,Colo. C10 ....5.575
Munhall,Pa. U5 ....5.275
Niles,Calif. P1 ....5.925
Phoenixville,Pa. P4 ....5.325
Portland,Oreg. O4 ....6.025
Seattle B3 ....6.025
S.Chicago,Ill. U5, W14 ..5.275
S.SanFrancisco B3 ....5.925
Sterling,Ill. N15 ....5.275
Torrance,Calif. C11 ....5.975
Weirton,W.Va. W6 ....5.275

Wide Flange
Bethlehem,Pa. B2 ....5.325
Clairton,Pa. U5 ....5.275
Fontana,Calif. K1 ....6.225
IndianaHarbor,Ind. I-2 ..5.275
Lackawanna,N.Y. B2 ..5.325
Munhall,Pa. U5 ....5.275
Phoenixville,Pa. P4 ....5.325
S.Chicago,Ill. U5 ....5.275

Alloy Std. Shapes
Aliquippa,Pa. J5 ....6.55
Clairton,Pa. U5 ....6.55
Gary,Ind. U5 ....6.55
Houston S5 ....6.65
KansasCity,Mo. S5 ....6.65
Munhall,Pa. U5 ....6.55
S.Chicago,Ill. U5 ....6.55

H.S., L.A. Std. Shapes
Aliquippa,Pa. J5 ....7.75
Bessemer,Ala. T2 ....7.75
Bethlehem,Pa. B2 ....7.80
Clairton,Pa. U5 ....7.75
Fairfield,Ala. T2 ....7.75
Fontana,Calif. K1 ....8.55
Gary,Ind. U5 ....7.75
Geneva,Utah C11 ....7.75
Houston S5 ....7.85
Ind.Harbor,Ind. I-2, Y1 7.75
Johnstown,Pa. B2 ....7.80
KansasCity,Mo. S5 ....7.85
Lackawanna,N.Y. B2 ..7.80
LosAngeles B3 ....8.45
Munhall,Pa. U5 ....7.75
Seattle B3 ....8.50
S.Chicago,Ill. U5, W14 ..7.75
S.SanFrancisco B3 ....8.40
Struthers,O. Y1 ....7.75

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 ....7.80
Lackawanna,N.Y. B2 ..7.80
Munhall,Pa. U5 ....7.75
S.Chicago,Ill. U5 ....7.75

PILING

BEARING PILES
Bethlehem,Pa. B2 ....5.325
Lackawanna,N.Y. B2 ..5.325
Munhall Pa. U5 ....5.275
S.Chicago,Ill. U5 ....5.275

STEEL SHEET PILING
Lackawanna,N.Y. B2 ..6.225
Munhall,Pa. U5 ....6.225
S.Chicago,Ill. U5 ....6.225
Weirton,W.Va. W6 ....6.225

PLATES

PLATES, Carbon Steel
Ala.City, Ala. R2 ....5.10
Aliquippa,Pa. J5 ....5.10
Ashland,Ky. (15) A10 ..5.10
Bessemer,Ala. T2 ....5.10
Clairton,Pa. U5 ....5.10
Claymont,Del. C22 ....5.10
Cleveland J5, R2 ....5.20
Coatesville,Pa. L7 ....5.10
Conshohocken,Pa. A3 ..5.20
Ecorse,Mich. G5 ....5.20
Fairfield,Ala. T2 ....5.10
Fontana,Calif.(30) K1 ..5.90
Gary,Ind. U5 ....5.10
Geneva,Utah C11 ....5.10
GraniteCity,Ill. G4 ....5.30
Harrisburg,Pa. P4 ....5.10
Houston S5 ....5.20
Ind.Harbor,Ind. I-2, Y1 ..5.10
Johnstown,Pa. B2 ....5.10
Lackawanna,N.Y. B2 ..5.10
LoneStar,Tex. L6 ....5.45
Mansfield,O. E6 ....5.10
Minnequa,Colo. C10 ....5.95
Munhall,Pa. U5 ....5.10
Newport,Ky. A2 ....5.10
Pittsburgh J5 ....5.10
Riverdale,Ill. A1 ....5.10
Seattle B3 ....6.00
Sharon,Pa. S3 ....5.10
S.Chicago,Ill. U5, W14 ..5.10
SparrowsPoint,Md. B2 ..5.10
Sterling,Ill. N15 ....5.10
Steubenville,C. W10 ....5.10
Warren,O. R2 ....5.10
Youngstown U5, Y1 ....5.10

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 ....6.75
Fontana,Calif. K1 ....7.55
Geneva,Utah C11 ....6.75
Houston S5 ....6.85
Johnstown,Pa. B2 ....6.75
SparrowsPoint,Md. B2 ..6.75

PLATES, Wrought Iron
Economy,Pa. B14 ....13.15

PLATES, H.S., L.A.
Aliquippa,Pa. J5 ....7.625
Bessemer,Ala. T2 ....7.625
Clairton,Pa. U5 ....7.625
Claymont,Del. C22 ....7.625
Cleveland J5, R2 ....7.625
Coatesville,Pa. L7 ....7.925
Conshohocken,Pa. A3 ..7.625
Economy,Pa. B14 ....7.625
Ecorse,Mich. G5 ....7.725
Fairfield,Ala. T2 ....7.625
Farrell,Pa. S3 ....7.625
Fontana,Calif.(30) K1 ..8.425
Gary,Ind. U5 ....7.625
Geneva,Utah C11 ....7.625
Houston S5 ....7.725
Ind.Harbor,Ind. I-2, Y1 7.625
Johnstown,Pa. B2 ....7.625
Munhall,Pa. U5 ....7.625
Pittsburgh J5 ....7.625
Seattle B3 ....8.525
Sharon,Pa. S3 ....7.625
S.Chicago,Ill. U5, W14 7.625
SparrowsPoint,Md. B2 ..7.625
Warren,O. R2 ....7.625
Youngstown U5 ....7.625

PLATES, ALLOY
Aliquippa,Pa. J5 ....7.20
Claymont,Del. C22 ....7.20
Coatesville,Pa. L7 ....7.20
Economy,Pa. B14 ....7.20
Farrell,Pa. S3 ....7.20
Fontana,Calif.(30) K1 ..8.00
Gary,Ind. U5 ....7.20
Houston S5 ....7.30
Ind.Harbor,Ind. Y1 ....7.20
Johnstown,Pa. B2 ....7.20
Lowellville,O. S3 ....7.20
Munhall,Pa. U5 ....7.20
Newport,Ky. A2 ....7.20
Pittsburgh J5 ....7.20
Seattle B3 ....8.10
Sharon,Pa. S3 ....7.20
S.Chicago,Ill. U5, W14 ..7.20
SparrowsPoint,Md. B2 ..7.20
Youngstown Y1 ....7.20

FLOOR PLATES
Cleveland J5 ....6.175
Conshohocken,Pa. A3 ..6.175
Ind.Harbor,Ind. I-2 ....6.175
Munhall,Pa. U5 ....6.175
S.Chicago,Ill. U5 ....6.175

PLATES, Ingot Iron
Ashland c.l. (15) A10 ..5.35
Ashland l.c.l. (15) A10 ..5.85
Cleveland c.l. R2 ....5.85
Warren,O. c.l. R2 ....5.85

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 ..5.425
Aliquippa,Pa. (9) J5 ..5.425
Alton,Ill. L1 ....5.625
Atlanta(9) A11 ....5.625
Bessemer,Ala.(9) T2 ..5.425
Birmingham(9) C15 ..5.425
Buffalo(9) R2 ....5.425
Clairton,Pa. (9) U5 ....5.425
Cleveland(9) R2 ....5.425
Ecorse,Mich.(9) G5 ....5.525
Emeryville,Calif. J7 ..6.175
Fairfield,Ala(9) T2 ..5.425
Fairless,Pa. (9) U5 ..5.575
Fontana,Calif.(9) K1 ..6.125
Gary,Ind.(9) U5 ....5.425
Houston (9) S5 ....5.675
Ind.Harbor(9) I-2, Y1 5.425
Johnstown,Pa.(9) B2 ..5.425
Joliet,Ill. P22 ....5.425
KansasCity,Mo.(9) S5 ..5.675
Lackawanna(9) B2 ....5.425
LosAngeles(9) B3 ....6.125
Milton,Pa. M18 ....5.575
Minnequa,Colo. C10 ..5.875
Niles,Calif. P1 ....6.125
N.Tonawanda,N.Y.(23)B11 5.775
Pittsburg,Calif.(9) C11..6.125
Pittsburgh(9) J5 ....5.425
Portland,Oreg. O4 ....6.175
Seattle B3, N14 ....6.175
S.Ch'c'go(9)R2,U5,W14 5.425
S.Duquesne,Pa.(9) U5 ..5.425
S.SanFran.,Calif.(9)B3 6.175
Sterling,Ill.(1)(9) N15 ..5.425
Sterling,Ill.(9) N15 ....5.525
Struthers,O. Y1 ....5.425
Tonawanda,N.Y. B12 ..5.425
Torrance,Calif.(9) C11..6.125
Youngstown(9) R2, U5 ..5.425

BARS, H.R. Leaded Alloy (Including leaded extra)
Warren,O. C17 ....7.475

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 ....6.475
Bethlehem,Pa. B2 ....6.475
Bridgeport,Conn. C32 ..6.55
Buffalo R2 ....6.475
Canton,O. R2, T7 ....6.475
Clairton,Pa. U5 ....6.475
Detroit S41 ....6.475
Economy,Pa. B14 ....6.475
Ecorse,Mich. G5 ....6.575
Fairless,Pa. U5 ....6.625
Farrell,Pa. S3 ....6.475
Fontana,Calif. K1 ....7.525
Gary,Ind. U5 ....6.475
Houston S5 ....6.725
Ind.Harbor,Ind. I-2, Y1 6.475
Johnstown,Pa. B2 ....6.475
KansasCity,Mo. S5 ....6.725
Lackawanna,N.Y. B2 ..6.475
Lowellville,O. S3 ....6.475
LosAngeles B3 ....7.525
Massillon,O. R2 ....6.475
Midland,Pa. C18 ....6.475
Pittsburgh J5 ....6.475
Sharon,Pa. S3 ....6.475
S.Chicago R2, U5, W14 6.475
S.Duquesne,Pa. U5 ....6.475
Struthers,O. Y1 ....6.475
Warren,O. C17 ....6.475
Youngstown U5 ....6.475

BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy
Aliquippa,Pa. J5 ....7.925
Bessemer,Ala. T2 ....7.925
Bethlehem,Pa. B2 ....7.925
Clairton,Pa. U5 ....7.925
Cleveland R2 ....7.925
Ecorse,Mich. G5 ....8.025
Fairfield,Ala. T2 ....7.925
Fontana,Calif. K1 ....8.625
Gary,Ind. U5 ....7.925
Houston S5 ....8.175
Ind.Harbor,Ind. Y1 ....7.925
Johnstown,Pa. B2 ....7.925
KansasCity,Mo. S5 ....8.175
Lackawanna,N.Y. B2 ..7.925
LosAngeles B3 ....8.625
Pittsburgh J5 ....7.925
Seattle B3 ....8.675
S.Chicago,Ill. U5, W14 7.925
S.Duquesne,Pa. U5 ....7.925
S.SanFrancisco B3 ....8.675
Struthers,O. Y1 ....7.925
Youngstown U5 ....7.925

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 ..5.575
Houston(9) S5 ....5.675
KansasCity,Mo.(9) S5..5.675
Lackawanna(9) B2 ....5.425
Sterling,Ill. N15 ....5.525
Sterling,Ill.(1) N15 ..5.425
Tonawanda,N.Y. B12 ..5.425

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 ....5.425
Atlanta A11 ....5.625
Joliet,Ill. P22 ....5.425
Niles,Calif. P1 ....6.125
Pittsburgh J5 ....5.425
Portland,Oreg. O4 ....6.175
SanFrancisco S7 ....6.275
Seattle B3 ....6.175

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 ....6.55
Clairton,Pa. U5 ....6.55
Gary,Ind. U5 ....6.55
Houston S5 ....6.80
KansasCity,Mo. S5 ....6.80
Pittsburgh J5 ....6.55
Youngstown U5 ....6.55

BARS, C.F., Leaded Alloy (Including leaded extra)
Ambridge,Pa. W18 ...9.925
BeaverFalls,Pa. M12 ..9.925
Camden,N.J. P13 ....10.10
Chicago W18 ....9.925
Cleveland C20 ....9.925
Elyria,O. W8 ....9.925
LosAngeles S30
(Grade A) 11.30
(Grade B) 11.80
Los Angeles P2
(Grade A) 11.40
(Grade B) 11.90
Monaca,Pa. S17 ....9.925
Newark,N.J. W18 ....10.10
SpringCity,Pa. K3 ....10.10
Warren,O. C17 ....9.925

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....7.30
BeaverFalls,Pa. M12,R2 7.30
Birmingham C15 ....7.90
Buffalo B5 ....7.35
Camden,N.J. P13 ....7.75
Carnegie,Pa. C12 ....7.30
Chicago W18 ....7.30
Cleveland A7, C20 ....7.30
Detroit B5, P17 ....7.50
Detroit S41 ....7.30
Donora,Pa. A7 ....7.30
Elyria,O. W8 ....7.30
FranklinPark,Ill. N5 ....7.30
Gary,Ind. R2 ....7.30
GreenBay,Wis. F7 ....7.30
Hammond,Ind. J5, L2 ..7.30
Hartford,Conn. R2 ....7.80
Harvey,Ill. B5 ....7.30
LosAngeles (49) S30 ..8.75
LosAngeles P2, R2 ....8.75
Mansfield,Mass. B5 ....7.85
Massillon,O. R2, R8 ....7.30
Midland,Pa. C18 ....7.30
Monaca,Pa. S17 ....7.30
Newark,N.J. W18 ....7.75
NewCastle,Pa.(17) B4 ..7.30
Pittsburgh J5 ....7.30
Plymouth,Mich. P5 ....7.55
Putnam,Conn. W18 ....7.85
Readville,Mass. C14 ....7.85
S.Chicago,Ill. W14 ....7.30
SpringCity,Pa. K3 ....7.75
Struthers,O. Y1 ....7.30
Warren,O. C17 ....7.30
Willimantic,Conn. J5 ..7.80
Waukegan,Ill. A7 ....7.30
Youngstown F3, Y1 ....7.30

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19..6.55

BARS, Cold Finished Alloy
Ambridge,Pa. W18 ....8.775
BeaverFalls,Pa.M12,R2 8.775
Bethlehem,Pa. B2 ....8.775
Bridgeport,Conn. C32 ..8.925
Buffalo B5 ....8.775
Camden,N.J. P13 ....8.95
Canton,O. T7 ....8.775
Carnegie,Pa. C12 ....8.775
Chicago W18 ....8.775
Cleveland A7, C20 ....8.775
Detroit B5, P17 ....8.975
Detroit S41 ....8.775
Donora,Pa. A7 ....8.775
Elyria,O. W8 ....8.775
FranklinPark,Ill. N5 ..8.775
Gary,Ind. R2 ....8.775
GreenBay,Wis. F7 ....8.775
Hammond,Ind. J5, L2 ..8.775
Hartford,Conn. R2 ....9.075
Harvey,Ill. B5 ....8.775
Lackawanna,N.Y. B2 ..8.775
LosAngeles P2, S30 ....10.75
Mansfield,Mass. B5 ....9.075
Massillon,O. R2, R8 ..8.775
Midland,Pa. C18 ....8.775
Monaca,Pa. S17 ....8.775
Newark,N.J. W18 ....8.95
Plymouth,Mich. P5 ....8.975
S.Chicago,Ill. W14 ....8.775
SpringCity,Pa. K3 ....8.95
Struthers,O. Y1 ....8.775
Warren,O. C17 ....8.775
Waukegan,Ill. A7 ....8.775
Worcester,Mass. A7 ..9.075
Youngstown F3, Y1 ..8.775

BARS, Reinforcing (To Fabricators)

Ala.City,Ala. R2 .....5.425
Atlanta A11 .....5.625
Birmingham C15, S42 .5.425
Buffalo R2 .....5.425
Cleveland R2 .....5.425
Ecorse,Mich. G5 .....5.775
Emeryville,Calif. J7 ..6.175
Fairfield,Ala. T2 .....5.425
Fairless,Pa. U5 .....5.575
Fontana,Calif. K1 ....6.125
Ft.Worth,Tex.(4)(26)T4 5.875
Gary,Ind. U5 .....5.425
Houston S5 .....5.675
Ind.Harbor,Ind. I-2, Y1 5.425
Johnstown,Pa. B2 ....5.425
Joliet,Ill. P22 .....5.425
KansasCity,Mo. S5 ....5.675
Lackawanna,N.Y. B2 ..5.425
LosAngeles B3 .....6.125
Milton,Pa. M18 .....5.575
Minnequa,Colo. C10 ..5.875
Niles,Calif. P1 .....6.125
Pittsburg,Calif. C11 ..6.125
Pittsburgh J5 .....5.425
Portland,Oreg. O4 ....6.175
SandSprings,Okla. S5 ..5.925
Seattle B3, N14 .....6.175
S.Chicago,Ill. R2 .....5.425
S.Duquesne,Pa. U5 ....5.425
S.SanFrancisco B3 ....6.175
SparrowsPoint,Md. B2 .5.425
Sterling,Ill.(1) N15 ..5.425
Sterling,Ill. N15 .....5.525
Struthers,O. Y1 .....5.425
Tonawanda,N.Y. B12 ..6.00
Torrance,Calif. C11 ...6.125
Youngstown R2, U5 ..5.425

BARS, Reinforcing (Fabricated; to Consumers)

Boston B2 .....7.65
Chicago U8 .....6.91
Cleveland U8 .....6.89
Johnstown,Pa. B2 ....7.08
KansasCity,Mo. S5 ....7.35
Lackawanna,N.Y. B2 ..6.85
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.55
Philadelphia U8 .....7.38
Pittsburgh J5, U8 ....7.10
Seattle B3, N14 .....7.70
SparrowsPt.,Md. B2 ....7.08
St.Paul U8 .....7.92
Williamsport,Pa. S19 ..7.00

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.45
Economy,Pa.(D.R.)B14 18.00
Economy,(Staybolt)B14 18.45

RAIL STEEL BARS

ChicagoHts.(3) C2, I-2 .5.325
ChicagoHts.(4)(44) I-2 .5.425
ChicagoHts.(4) C2 ....5.425
Franklin,Pa. (3) F5 ..5.325
Franklin,Pa. (4) F5 ..5.425
JerseyShore,Pa.(3) J8 ..5.30
Marion,O.(3) P11 ....5.325
Tonawanda(3) R12 ....5.325
Tonawanda(4) B12 ....6.00
Williamsport,Pa. (3)S19.5.50

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Ala.City,Ala. R2 .....4.925
Allenport,Pa. P7 .....4.925
Ashland,Ky.(8) A10 ..4.925
Cleveland J5, R2 ....4.925
Conshohocken,Pa. A3 ..4.975
Detroit(8) M1 .....5.025
Ecorse,Mich. G5 .....5.025
Fairfield,Ala. T2 .....4.925
Fairless,Pa. U5 .....4.975
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....4.925
Geneva,Utah C11 ....5.025
GraniteCity,Ill. (8)G4..5.125
Ind.Harbor,Ind. I-2, Y1 4.925
Irvin,Pa. U5 .....4.925
Lackawanna,N.Y. B2 ..4.925
Mansfield,O. E6 .....4.925
Munhall,Pa. U5 .....4.925
Newport,Ky.(8) A2 ...4.925
Niles,O. M21, S3 .....4.925
Pittsburg,Calif. C11 ..5.625
Pittsburgh J5 .....4.925
Portsmouth,O. P12 ....4.925
Riverdale,Ill. A1 .....4.925
Sharon,Pa. S3 .....4.925
S.Chicago,Ill. W14 ....4.925
SparrowsPoint,Md. B2 ..4.925
Steubenville,O. W10 ...4.925
Warren,O. R2 .....4.925
Weirton,W.Va. W6 ....4.925
Youngstown U5, Y1 ..4.925

SHEETS, H.R.,(19 Ga. & Lighter)

Niles,O. M21 .....6.05

SHEETS, H.R. Alloy

Gary,Ind. U5 .....8.10
Ind.Harbor,Ind. Y1 ....8.10
Irvin,Pa. U5 .....8.10
Munhall,Pa. U5 .....8.10
Newport,Ky. A2 .....8.10
Youngstown U5, Y1 ...8.10

SHEETS, H.R.(14 Ga. & Heavier) High-Strength, Low-Alloy

Cleveland J5, R2 ....7.275
Conshohocken,Pa. A3..7.325
Ecorse,Mich. G5 .....7.375
Fairfield,Ala. T2 .....7.275
Fairless,Pa. U5 .....7.325
Farrell,Pa. S3 .....7.275
Fontana,Calif. K1 ....8.175
Gary,Ind. U5 .....7.275
Ind.Harbor,Ind. I-2, Y1 7.275
Irvin,Pa. U5 .....7.275
Lackawanna (35) B2 ..7.275
Munhall,Pa. U5 .....7.275
Pittsburgh J5 .....7.275
S.Chicago,Ill. U5, W14 7.275
Sharon,Pa. S3 .....7.275
SparrowsPoint(36) B2 .7.275
Warren,O. R2 .....7.275
Weirton,W.Va. W6 ...7.275
Youngstown U5, Y1 ..7.275

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ..5.175
Cleveland R2 .....5.675
Warren,O. R2 .....5.675

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....6.80
Middletown,O. A10 ....6.55
Warren,O. R2 .....6.80

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 ..6.05
Allenport,Pa. P7 .....6.05
Cleveland J5, R2 .....6.05
Conshohocken,Pa. A3 ..6.10
Detroit M1 .....6.05
Ecorse,Mich. G5 .....6.15
Fairfield,Ala. T2 .....6.05
Fairless,Pa. U5 .....6.10
Follansbee,W.Va. F4 ..6.05
Fontana,Calif. K1 ....7.30
Gary,Ind. U5 .....6.05
GraniteCity,Ill. G4 ...6.25
Ind.Harbor,Ind. I-2, Y1 6.05
Irvin,Pa. U5 .....6.05
Lackawanna,N.Y. B2 ..6.05
Mansfield,O. E6 .....6.05
Middletown,O. A10 ....6.05
Newport,Ky. A2 .....6.05
Pittsburg,Calif. C11 ...7.00
Pittsburgh J5 .....6.05
Portsmouth,O. P12 ....6.05
SparrowsPoint,Md. B2 ..6.05
Steubenville,O. W10 ...6.05
Warren,O. R2 .....6.05
Weirton,W.Va. W6 ....6.05
Yorkville,O. W10 .....6.05
Youngstown Y1 .....6.05

SHEETS, Cold-Rolled High-Strength, Low-Alloy

Cleveland J5, R2 ....8.975
Ecorse,Mich. G5 .....9.075
Fairless,Pa. U5 .....9.025
Fontana,Calif. K1 ...10.275
Gary,Ind. U5 .....8.975
IndianaHarbor,Ind. Y1 8.975
Irvin,Pa. U5 .....8.975
Lackawanna(37) B2 ..8.975
Pittsburgh J5 .....8.975
SparrowsPoint (38) B2 8.975
Warren,O. R2 .....8.975
Weirton,W.Va. W6 ....8.975
Youngstown Y1 .....8.975

SHEETS, Culvert

	Cu Steel	Cu Fe
Ashland,Ky. A10	.6.95	7.20
Canton,O. R2	....6.95	7.45
Fairfield T2	....6.95	7.20
Gary,Ind. U5	....6.95	7.20
GraniteCity,Ill. G4	7.15	...
Ind.Harbor I-2	..6.95	7.20
Irvin,Pa. U5	....6.95	7.20
Kokomo,Ind. C16	7.05	...
MartinsFry. W10	.6.95	7.20
Pitts.,Calif. C11	..7.70	...
Pittsburgh J5	....6.95	...
SparrowsPt. B2	..6.95	...

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 .. 7.20

SHEETS, Galvanized Steel Hot-Dipped

Ala.City,Ala. R2 .....6.60‡
Ashland,Ky. A10 .....6.60†
Canton,O. R2 .....6.60‡
Dover,O. R1 .....6.60†
Fairfield,Ala. T2 .....6.60†
Gary,Ind. U5 .....6.60*
GraniteCity,Ill. G4 ....6.80*
Ind.Harbor,Ind. I-2 ...6.60†
Irvin,Pa. U5 .....6.60*
Kokomo,Ind. C16 ....6.70‡
MartinsFerry,O. W10 ..6.60*
Middletown,O. A10 ...6.60†
Pittsburg,Calif. C11 ...7.35*
Pittsburgh J5 .....6.60†
SparrowsPt.,Md. B2 ..6.60†
Warren,O. R2 .....6.60†
Weirton,W.Va. W6 ....6.60*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....7.325

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....9.725
SparrowsPt.(39) B2 ..9.725

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.00
Irvin,Pa. U5 .....7.00

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 .....6.85
Middletown,O. A10 ....6.85

SHEETS, Electrogalvanized

Cleveland (28) R2 ...7.425
Niles,O. (28) R2 .....7.425
Weirton,W.Va. W6 ..7.275

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) .9.25
Butler,Pa. A10 (type 2) .9.35

SHEETS, Enameling Iron

Ashland,Ky. A10 .....6.625
Cleveland R2 .....6.625
Gary,Ind. U5 .....6.625
GraniteCity,Ill. G4 ....6.825
Ind.Harbor,Ind. I-2, Y1 6.625
Irvin,Pa. U5 .....6.625
Middletown,O. A10 ....6.625
Niles,O. M21, S3 .....6.625
Youngstown Y1 .....6.625

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ..8.65
Ind.Harbor,Ind. I-2 ..8.475
Yorkville,O. W10 .....8.475

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.00
Gary,Ind. U5 .....7.00
Mansfield,O. E6 .....7.00
Middletown,O. A10 ....7.00
Niles,O. M21, S3 .....7.00
Warren,O. R2 .....7.00
Weirton,W.Va. W6 ....7.00

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.40

Key to Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C7 Cleve.Cold Rolling Mills
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 CarpenterSteelofN.Eng.

D2 Detroit Steel Corp.
D3 Dearborn Div., Sharon Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 EasternGas&FuelAssoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel& Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md.Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Titanium Corp.
M22 Mill Strip Products Co.

N1 National Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelson Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N14 Northwest.SteelRoll.Mill
N15 Northwestern S.&W. Co.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co., Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless Steel Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.

T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Div., H. K. Porter Co. Inc.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	.4.925
Allenport,Pa. P7	.4.925
Alton,Ill. L1	.5.125
Ashland,Ky.(8) A10	.4.925
Atlanta A11	.5.125
Bessemer,Ala. T2	.4.925
Birmingham C15	.4.925
Buffalo (27) R2	.4.925
Conshohocken,Pa. A3	.4.975
Detroit M1	.5.025
Ecorse,Mich. G5	.5.025
Fairfield,Ala. T2	.4.925
Fontana,Calif. K1	.5.825
Gary,Ind. U5	.4.925
Ind.Harbor,Ind. I-2, Y1	4.925
Johnstown,Pa. (25) B2	4.925
Lackaw'na,N.Y.(25) B2	4.925
LosAngeles(25) B3	.5.675
Minnequa,Colo. C10	.6.025
Pittsburg,Calif. C11	.5.675
Riverdale,Ill. A1	.4.925
SanFrancisco S7	.6.35
Seattle(25) B3	.6.35
Seattle N14	.6.35
Sharon,Pa. S3	.4.925
S.SanFrancisco(25) B3	5.675
SparrowsPoint,Md. B2	4.925
Sterling,Ill. (1) N15	.4.925
Sterling,Ill. N15	.5.025
Torrance,Calif. C11	.5.675
Warren,O. R2	.4.925
Weirton,W.Va. W6	.4.925
Youngstown U5	.4.925

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18	.8.10
Farrell,Pa. S3	.8.10
Gary,Ind. U5	.8.10
Houston S5	.8.35
Ind.Harbor,Ind. Y1	.8.10
KansasCity,Mo. S5	.8.35
LosAngeles B3	.9.30
Lowellville,O. S3	.8.10
Newport,Ky. A2	.8.10
Sharon,Pa. A2	.8.10
S.Chicago,Ill. W14	.8.10
Youngstown U5, Y1	.8.10

STRIP, Hot-Rolled High-Strength, Low-Alloy

Bessemer,Ala. T2	.7.325
Conshohocken,Pa. A3	.7.325
Ecorse,Mich. G5	.7.425
Fairfield,Ala. T2	.7.325
Farrell,Pa. S3	.7.325
Gary,Ind. U5	.7.325
Ind.Harbor,Ind. I-2, Y1	7.325
Lackawanna,N.Y. B2	.7.325
LosAngeles(25) B3	.8.075
Seattle(25) B3	.8.325
Sharon,Pa. S3	.7.325
S.Chicago,Ill. W14	.7.325
S.SanFrancisco(25) B3	8.075
SparrowsPoint,Md. B2	.7.325
Warren,O. R2	.7.325
Weirton,W.Va. W6	.7.325
Youngstown U5, Y1	.7.325

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	.5.175
Warren,O. R2	.5.675

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	.7.15
Baltimore T6	.7.15
Boston T6	.7.70
Buffalo S40	.7.15
Cleveland A7, J5	.7.15
Conshohocken,Pa. A3	.7.20
Dearborn,Mich. D3	.7.25
Detroit D2, M1, P20	.7.25
Dover,O. G6	.7.15
Ecorse,Mich. G5	.7.25
Evanston,Ill. M22	.7.25
Follansbee,W.Va. F4	.7.15
Fontana,Calif. K1	.9.00
FranklinPark,Ill. T6	.7.25
Ind.Harbor,Ind. Y1	.7.15
Indianapolis J5	.7.30
LosAngeles J5	.9.05
LosAngeles C1	.9.20
NewBedford,Mass. R10	.7.60
NewBritain(10) S15	.7.15
NewCastle,Pa. B4, E5	.7.15
NewHaven,Conn. D2	.7.60
NewKensington,Pa. A6	.7.15
Pawtucket,R.I. R3	.7.80
Pawtucket,R.I. N8	.7.70
Philadelphia(45) P24	.7.70
Pittsburgh J5	.7.15
Riverdale,Ill. A1	.7.25
Rome,N.Y. (32) R6	.7.15
Sharon,Pa. S3	.7.15
Trenton,N.J. (31) R5	.8.60
Wallingford,Conn. W2	.7.60
Warren,O. R2, T5	.7.15
Weirton,W.Va. W6	.7.15
Worcester,Mass. A7	.7.70
Youngstown J5, Y1	.7.15

STRIP, Cold-Rolled Alloy

Boston T6	.15.40
Carnegie,Pa. S18	.15.05
Cleveland A7	.15.05
Dover,O. G6	.15.05
Farrell,Pa. S3	.15.05
FranklinPark,Ill. T6	.15.05
Harrison,N.J. C18	.15.05
Indianapolis J5	.15.20
Lowellville,O. S3	.15.05
Pawtucket,R.I. N8	.15.40
Riverdale,Ill. A1	.15.05
Sharon,Pa. S3	.15.05
Worcester,Mass. A7	.15.35
Youngstown J5	.15.05

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	.10.45
Dearborn,Mich. D3	.10.60
Dover,O. G6	.10.45
Ecorse,Mich. G5	.10.55
Farrell,Pa. S3	.10.50
Ind.Harbor,Ind. Y1	.10.65
Sharon,Pa. S3	.10.50
Warren,O. R2	.10.45
Weirton,W.Va. W6	.10.50
Youngstown Y1	.10.65

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	.7.90

STRIP, C.R. Electrogalvanized

Cleveland A7	.7.15*
Dover,O. G6	.7.15*
Evanston,Ill. M22	.7.25*
Riverdale,Ill. A1	.7.25*
Warren,O. B9, T5	.7.15*
Worcester,Mass. A7	.7.70*
Youngstown J5	.7.15*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Sharon,Pa. S3	.7.275

TIGHT COOPERAGE HOOP

Atlanta A11	.5.65
Riverdale,Ill. A1	.5.50
Sharon,Pa. S3	.5.35
Youngstown U5	.5.35

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	...	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. D3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	....	....
Fostoria,O. S1	10.05	11.15	13.10	16.10	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	....	....	12.90	16.10	19.30
Indianapolis J5	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
Los Angeles J5	11.15	12.60	14.80	....	....
NewBritain,Conn.(10) S15	8.95	10.40	12.60	15.60	18.55
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	8.95	10.40	12.60	15.60	....
NewYork W3	....	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	....	10.70	12.90	16.10	19.30
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown J5	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)

	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	18.10	21.95	26.30
Buffalo W12	18.10	....	....
Fostoria,O. S1	18.30	22.15	....
FranklinPark,Ill. T6	18.45	22.30	26.65
Harrison,N.J. C18	18.10	21.95	26.30
NewYork W3	18.10	21.95	26.30
Palmer,Mass. W12	18.10	....	....
Trenton,N.J. R5	18.10	21.95	26.30
Worcester,Mass. A7, T6	18.10	21.95	26.30
Youngstown J5	18.45	22.30	26.65

SILICON STEEL

H.R.SHEETS(22 Ga.,cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	....	11.80	12.90	13.95
Mansfield,O. E6	9.625	11.10	11.80	12.90	13.95
Newport,Ky. A2	9.625	11.10	11.80	12.90	13.95
Niles,O. M21, S3	9.625	11.10	11.80	12.90	....
Vandergrift,Pa. U5	....	11.10	11.80	12.90	13.95
Warren,O. R2	9.625	11.10	11.80	12.90	....
Zanesville,O. A10	....	11.10	11.80	12.90	13.95
Zanesville,O. A10 (SP Coils)	....	....	11.55	12.65	13.70

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	11.35	12.05	13.15	14.20
Brackenridge,Pa. A4	....	....	12.05	13.15	14.20
GraniteCity,Ill. G4	9.825*	11.05*	11.75*	12.85*	....
IndianaHarbor,Ind. I-2	9.625†	10.85*	11.55*	12.65*	....
Mansfield,O. E6	9.625*	11.35	12.05	13.15	14.20
Vandergrift,Pa. U5	9.625*	11.35	12.05	13.15	14.20
Warren,O. R2	9.625*	11.35	12.05	13.15	14.20
Zanesville,O. A10(FP Coils)	....	11.35	12.05	13.15	14.20

H.R. SHEETS (22Ga., cut lengths)	Transformer Grades T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.00	15.55	16.05	17.10
Vandergrift,Pa. U5	14.75	15.55	16.05	17.10
Zanesville,O. A10	15.00	15.55	16.05	17.10

C.R. COILS & CUT LENGTHS (22 Ga.)

	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	17.60	19.20	19.70	20.20	....
Butler,Pa. A10	....	....	19.20	19.70	20.20	....
Vandergrift,Pa. U5	16.60	17.60	19.20	19.70	20.20	15.25**
Warren,O. R2	....	....	....	....	....	15.25‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. **Cut lengths, ¾-cent lower.

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$8.75	$9.00	$9.40
Fairfield,Ala. T2	8.85	9.10	9.50
Fairless,Pa. U5	8.85	9.10	9.50
Fontana,Calif. K1	9.50	9.75	10.15
Gary,Ind. U5	8.75	9.00	9.40
GraniteCity,Ill. G4	8.85	9.10	9.50
IndianaHarbor,Ind. I-2, Y1	8.75	9.00	9.40
Irvin,Pa. U5	8.75	9.00	9.40
Niles,O. R2	8.75	9.00	9.40
Pittsburg,Calif. C11	9.50	9.75	10.15
SparrowsPoint,Md. B2	8.85	9.10	9.50
Weirton,W.Va. W6	8.75	9.00	9.40
Yorkville,O. W10	8.75	9.00	9.40

ELECTROTIN (22-27 Gage; Dollars per 100 lb)			
Aliquippa,Pa. J5	7.725	7.925	....
Niles,O. R2	7.725	7.925	8.125

TIN PLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$10.05	$10.30
Fairfield,Ala. T2	10.15	10.40
Fairless,Pa. U5	10.15	10.40
Fontana,Calif. K1	10.80	11.05
Gary,Ind. U5	10.05	10.30
Irvin,Pa. U5	10.05	10.30
Pitts.,Calif. C11	10.80	11.05
Sp.Pt.,Md. B2	10.15	10.40
Weirton,W.Va. W6	10.05	10.30
Yorkville,O. W10	10.05	10.30

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$7.85
Fairfield,Ala. T2	7.95
Fairless,Pa. U5	7.95
Fontana,Calif. K1	8.60
Gary,Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor,Ind. I-2, Y1	7.85
Irvin,Pa. U5	7.85
Niles,O. R2	7.85
Pittsburg,Calif. C11	8.60
SparrowsPoint,Md. B2	7.95
Weirton,W.Va. W6	7.85
Yorkville,O. W10	7.85

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5	$7.50
Gary,Ind. U5	7.50
GraniteCity,Ill. G4	7.60
Ind.Harbor,Ind Y1	7.50
Irvin,Pa. U5	7.50
Yorkville,O. W10	7.50

MANUFACTURING TERNES (Special Coated, Base Box)

Gary,Ind. U5	$9.70
Irvin,Pa. U5	9.70

ROOFING SHORT TERNES (8 lb Coated, Base Box)

Gary,Ind. U5	$11.25

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	.7.65
Aliquippa,Pa. J5	.7.65
Alton,Ill. L1	.7.85
Atlanta A11	.7.85
Bartonville,Ill. K4	.7.75
Buffalo W12	.7.65
Chicago W13	.7.65
Cleveland A7, C20	.7.65
Crawfordsville,Ind. M8	.7.75
Donora,Pa. A7	.7.65
Duluth A7	.7.65
Fairfield,Ala. T2	.7.65
Fostoria,O.(24) S1	.7.75
Houston S5	.7.90
Jacksonville,Fla. M8	.8.00
Johnstown,Pa. B2	.7.65
Joliet,Ill A7	.7.65
KansasCity,Mo. S5	.7.90
Kokomo,Ind. C16	.7.75
LosAngeles B3	.8.60
Minnequa,Colo. C10	.7.90
Monessen,Pa. P7, P16	.7.65
N.Tonawanda,N.Y. B11	7.65
Palmer,Mass. W12	.7.95
Pittsburg,Calif. C11	.8.60
Portsmouth,O. P12	.7.65
Rankin,Pa. A7	.7.65
S.Chicago,Ill. R2	.7.65
S.SanFrancisco C10	.8.60
SparrowsPoint,Md. B2	.7.75
Sterling,Ill.(1) N15	.7.65
Sterling,Ill. N15	.7.75
Struthers,O. Y1	.7.65
Waukegan,Ill. A7	.7.65
Worcester,Mass. A7	.7.95

WIRE, Gal'd ACSR for Cores

Bartonville,Ill. K4	.12.65
Buffalo W12	.12.65
Cleveland A7	.12.65
Donora,Pa. A7	.12.65
Duluth A7	.12.65
Johnstown,Pa. B2	.12.65
Minnequa,Colo. C10	.12.775
Monessen,Pa. P16	.12.65
Muncie,Ind. I-7	.12.85
NewHaven,Conn. A7	.12.95
Palmer,Mass. W12	.12.95
Pittsburg,Calif. C11	.13.45
Portsmouth,O. P12	.12.65
Roebling,N.J. R5	.12.95
SparrowsPt.,Md. B2	.12.75
Struthers,O. Y1	.12.65
Trenton,N.J. A7	.12.95
Waukegan,Ill. A7	.12.65
Worcester,Mass. A7	.12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	.9.30
Alton,Ill. L1	.9.50
Buffalo W12	.9.30
Cleveland A7	.9.30
Donora,Pa. A7	.9.30
Duluth A7	.9.30
Johnstown,Pa. B2	.9.30
KansasCity,Mo. S5	.9.55
LosAngeles B3	.10.25
Minnequa,Colo. C10	.9.50
Monessen,Pa. P7, P16	.9.30
NewHaven,Conn. A7	.9.60
Palmer,Mass. W12	.9.60
Pittsburg,Calif. C11	.10.25
Portsmouth,O. P12	.9.30
Roebling,N.J. R5	.9.60
S.Chicago,Ill. R2	.9.30
S.SanFrancisco C10	.10.25
SparrowsPt.,Md. B2	.9.40
Struthers,O. Y1	.9.30
Trenton,N.J. A7	.9.60
Waukegan,Ill. A7	.9.30
Worcester,A7, J4, T6	.9.60

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1	.15.80
Bartonville,Ill. K4	.15.70
Buffalo W12	.15.60
Chicago W13	.15.60
Cleveland A7	.15.60
Crawfordsville,Ind. M8	.15.70
Fostoria,O. S1	.15.60
Houston S5	.15.85
Jacksonville,Fla. M8	.15.95
Johnstown,Pa. B2	.15.60
KansasCity,Mo. S5	.15.85
Kokomo,Ind. C16	.15.60
Minnequa,Colo. C10	.15.85
Monessen,Pa. P7, P16	.15.60
Muncie,Ind. I-7	.15.80
Palmer,Mass.(12) W12	.15.90
S.SanFrancisco C10	.16.45
Waukegan,Ill. A7	.15.60
Worcester,Mass. A7, T6	15.90

ROPE WIRE

Bartonville,Ill. K4	.12.75
Buffalo W12	.12.75
Fostoria,O. S1	.12.75
Johnstown,Pa. B2	.12.75
Monessen,Pa. P7	.12.75
Muncie,Ind. I-7	.12.95
Palmer,Mass. W12	.13.05
Portsmouth,O. P12	.12.75
Roebling,N.J. R5	.13.05
SparrowsPt.,Md. B2	.12.85
Struthers,O. Y1	.12.75
Worcester,Mass. J4	.13.05

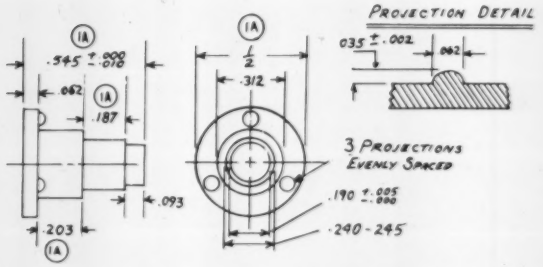
(A) Plow and Mild Plow; add 0.25c for Improved Plow

from 5 Expensive Operations to—

2 blows!

KEYSTONE XL WIRE STUDY

3.5 TIMES ACTUAL SIZE



Shaft for nylon rollers used in cabinet drawers. The blank formerly was made in 4 cuts on a screw machine — then the 3 tiny projections which anchor the nylon rollers were spot welded. Now Milford cold heads the part from Keystone "XL" Wire with one secondary operation to turn the small tenon. The two major shoulder diameters, head and projection, are produced in just two blows.

MILFORD RIVET

The MILFORD RIVET & MACHINE CO. finds Keystone Wire saves 70% in Costs . . . 85% in Time

Here is a typical example of how Milford uses Keystone "XL" Wire in meeting difficult cold upsetting requirements. Milford estimates that savings of 70% in cost and 85% in time have been effected by cold heading the part illustrated above as compared with the four operations it formerly took on a screw machine plus spot welding. Milford puts Keystone "XL" Wire to work at its five plants – Elyria, Ohio; Milford, Conn.; Hatboro, Pa.; Aurora, Ill.; and Norwalk, Calif. Milford recognizes *flowability* of Keystone "XL" Wire as the key to profitable runs of quality fasteners.

Manufacturers come to Milford with specific fastener requirements – then skilled Milford engineers design quality cold-formed parts. Here's where *teamwork* pays off. Milford and Keystone representatives find the most practical solution to metallurgical problems. This results in high quality – yet economical parts – fabricated perfectly for the job they were designed to do.

Close counsel and analysis of your wire problems are services you receive from your Keystone representative. Call him today!

Keystone Steel & Wire Company, Peoria 7, Illinois

KEYSTONE

WIRE FOR INDUSTRY

Keystone Steel & Wire Company
Peoria 7, Illinois

Brand New . . . COLD HEADING FACTS FOLDER . . . send coupon today! New folder discusses uses, applications, methods, technical facts, wire requirements.

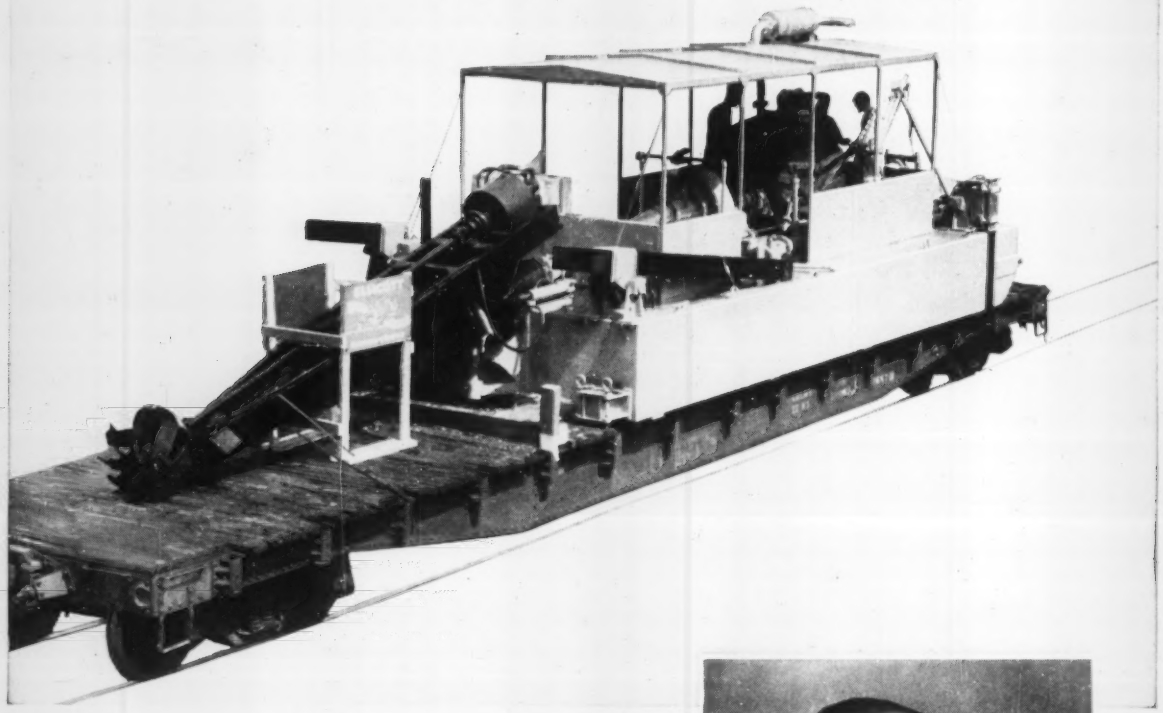
Name _____ Title _____

Company _____

Street _____

City _____ State _____

An Ellicott "Dragon" Dredge, constructed in part with Standard Steel Works forgings, ready for rail and freighter shipment to Hong Kong.



"To maintain our position of world leadership we must have superior service from our suppliers"

As suppliers of countless forgings to the Ellicott Machine Corporation for 30 years, we at Standard Steel Works feel we have been an integral part of the growth of Ellicott and in helping this world's largest dredge manufacturing company maintain its top position through all those years. We appreciate the fact that Mr. Mund and his associates realize it is not only by meeting design and steel analysis requirements for Ellicott, but also by consistently combining our know-how in steel fabrication with personalized attention to each order, that we have maintained our mutually satisfactory relationship. Every order we receive we accept as a service opportunity.

It is routine at Standard Steel Works to analyze all orders carefully and to present its requirements and possible problems on a personal, conference basis to the appropriate men in the shop; then to keep the customer continually advised on the progress of his order through our shops by means of frequent, periodic job-status reports. Our customers, whether they manufacture equipment for local use or for shipment to the far corners of the world, know that they can count on Standard Steel Works to deliver the right forgings at the right time—to help them maintain delivery schedules. Write or call Dept. 2M today and give us the opportunity to show you how our personalized service can prove invaluable in your operations.

"We are justly proud of our position as the world's largest designers and manufacturers of hydraulic dredges. Standard Steel Works is one of our suppliers which—in giving us that extra plus, superior service, while meeting our requirements for various forgings—have helped us maintain our world-wide leadership," *says Allan Mund, Vice President and General Manager, Ellicott Machine Corp., Baltimore, Md.*

Standard Steel Works Division

BALDWIN · LIMA · HAMILTON

BURNHAM, PENNSYLVANIA Rings • Shafts • Car wheels • Gear blanks • Flanges • Special shapes

WIRE, Tire Bead

Bartonville,Ill. K4	....16.55
Monessen,Pa. P16	....16.55
Roebling,N.J. R5	....17.05

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	....11.65
Baltimore T6	.....11.95
Boston T6	.....11.95
Buffalo W12	.....11.65
Chicago W13	.....11.75
Cleveland A7	.....11.65
Crawfordsville,Ind. M8	..11.65
Dover,O. G6	.....11.65
Fostoria,O. S1	.....11.65
FranklinPark,Ill. T6	..11.75
Kokomo,Ind. C16	....11.65
Massillon,O. R8	.....11.65
Milwaukee C23	.....11.85
Monessen,Pa. P7, P16	..11.65
Palmer,Mass. W12	...11.95
Pawtucket,R.I. N8	....11.95
Philadelphia P24	.....11.95
Riverdale,Ill. A1	.....11.75
Rome,N.Y. R6	.....11.65
Sharon,Pa. S3	.....11.65
Trenton,N.J. R5	.....11.95
Warren,O. B9	.....11.65
Worcester,Mass. A7, T6	11.95

NAILS, Stock — **Col.**

AlabamaCity,Ala. R2	..173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville, Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	..175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	178
Houston S5	178
Jacksonville,Fla.(20) M8	184
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	179

(To Wholesalers; per cwt)

Galveston,Tex. D7	....$9.10

NAILS, Cut (100 lb keg)

To Dealers (33)

Conshohocken,Pa. A3	..$9.80
Wheeling,W.Va. W10	...9.80

POLISHED STAPLES — **Col.**

AlabamaCity,Ala. R2	...175
Aliquippa,Pa. J5	175
Atlanta A11	177
Bartonville,Ill. K4	177
Crawfordsville,Ind M8	..177
Donora,Pa. A7	175
Duluth A7	175
Fairfield,Ala. T2	175
Jacksonville,Fla.(20) M8	186
Johnstown,Pa. B2	175
Joliet,Ill. A7	175
Kokomo,Ind. C6	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	175
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.)(Per 97 lb Net Box)

Coil No. 3150

AlabamaCity,Ala. R2	.$10.26
Atlanta A11	.....10.36
Bartonville,Ill. K4	....10.36
Buffalo W12	.....10.26
Chicago W13	.....10.26
Crawfordsville,Ind. M8	.10.36
Donora,Pa. A7	.....10.26
Duluth A7	.....10.26
Fairfield,Ala T2	.....10.26
Houston S5	.....10.51
Jacksonville,Fla. M8	..10.82
Johnstown,Pa. B2	....10.26
Joliet,Ill. A7	.....10.26
KansasCity,Mo. S5	....10.51
Kokomo,Ind. C16	....10.36
LosAngeles B3	.....11.05
Minnequa,Colo. C10	...10.51
Pittsburg,Calif. C11	..11.04
S.Chicago,Ill. R2	.....10.26
S.SanFrancisco C10	...11.04
SparrowsPt.,Md. B2	..10.36
Sterling,Ill.(37) N15	..10.36

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	.$10.60
Atlanta A11	.....10.70
Bartonville,Ill. K4	....10.70
Buffalo W12	.....10.60
Chicago W13	.....10.60
Crawfordsville,Ind. M8	.10.70
Donora,Pa. A7	.....10.60
Duluth A7	.....10.60
Fairfield,Ala T2	.....10.60
Houston S5	.....10.85
Jacksonville,Fla. M8	..11.16
Johnstown,Pa. B2	....10.60
Joliet, Ill. A7	.....10.60
KansasCity,Mo. S5	....10.85
Kokomo,Ind. C16	.....10.70
LosAngeles B3	.....11.40
Minnequa,Colo. C10	...10.85
Pittsburg,Calif. C11	...11.40
S.Chicago,Ill. R2	.....10.60
S. SanFrancisco C10	...11.40
SparrowsPt., Md. B2	..10.70
Sterling,Ill.(37) N15	..10.70

Coil No. 6500 Interim

AlabamaCity,Ala. R2	..$10.65
Atlanta A11	.....10.75
Bartonville,Ill. K4	....10.75
Buffalo W12	.....10.65
Chicago W13	.....10.65
Crawfordsville,Ind. M8	.10.75
Donora,Pa. A7	.....10.65
Duluth A7	.....10.65
Fairfield,Ala. T2	.....10.65
Houston S5	.....10.90
Jacksonville,Fla. M8	..11.21
Johnstown,Pa. B2	....10.65
Joliet,Ill. A7	.....10.65
KansasCity,Mo. S5	....10.90
Kokomo,Ind. C16	.....10.75
LosAngeles B3	.....11.45
Minnequa,Colo. C10	...10.90
Pittsburg,Calif. C11	...11.45
S.Chicago,Ill. R2	.....10.65
S.SanFrancisco C10	...11.45
SparrowsPt.,Md. B2	...10.75
Sterling,Ill(37) N15	...10.75

BALE TIES, Single Loop — **Col.**

AlabamaCity,Ala. R2	..212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	..214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	219
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg, Calif. C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md B2	214
Sterling,Ill.(7) N15	214
Williamsport,Pa. S19	175

WIRE, Barbed — **Col.**

AlabamaCity,Ala. R2	..193**
Aliquippa,Pa. J5	.....190§
Atlanta A11	.....198*
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	..198
Donora,Pa. A7	.....193†
Duluth A7	.....193†
Fairfield,Ala. T2	.....193†
Houston S5	.....198**
Jacksonville,Fla. M8	203
Johnstown,Pa. B2	....196§
Joliet,Ill. A7	.....193†
KansasCity,Mo. S5	...198**
Kokomo,Ind. C16	.....195†
Minnequa,Colo. C10	...198**
Monessen,Pa. P7	.....196*
Pittsburg,Calif. C11	....213†
Rankin,Pa. A7	.....193†
S.Chicago,Ill. R2	.....193**
S.SanFrancisco C10	..213**
SparrowsPoint,Md. B2	..198§
Sterling,Ill.(7) N15	....198§

WOVEN FENCE, 9-15 Ga. — **Col.**

Ala.City,Ala. R2	....187**
Aliq'ppa,Pa.9-14½ga.J5	190§
Atlanta A11	.....192*
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	..192
Donora,Pa. A7	.....187†
Duluth A7	.....187†
Fairfield,Ala. T2	.....187†
Houston S5	.....192**
Jacksonville,Fla. M8	197
Johnstown,Pa.(43) B2	....190§
Joliet,Ill. A7	.....187†
KansasCity,Mo. S5	....192**
Kokomo,Ind. C16	.....189†
Minnequa,Colo. C10	...192**
Pittsburg,Calif. C11	....210†
Rankin,Pa. A7	.....187†
S.Chicago,Ill. R2	.....187**
Sterling,Ill.(7) N15	....192§

	An'ld Stone	Galv. Stone
WIRE (16 gage)		
Ala.City,Ala.R2	17.15	18.70**
Aliq'ppa,Pa. J5	.17.15	18.95
Bartonville K4	..17.25	19.05
Cleveland A7	...17.15	....
Crawf'dsville M8	17.25	19.05
Fostoria,O. S1	..17.65	19.20†
Houston S5	... 17.40	18.95**
Jacksonville M8	.17.50	19.30
Johnstown B2	..17.15	18.95§
Kan.City,Mo. S5	17.40	....
Kokomo C16	..17.25	18.80†
Minnequa C10	.17.40	18.95**
P'lm'r,Mass.W12	17.45	19.00†
Pitts.,Calif. C11	.17.50	19.05†
SparrowsPt.	B2.17.25	19.05§
Sterling(37)N15	.17.25	19.05§
Waukegan A7	..17.15	18.70†
Worcester A7	..17.45	....

WIRE, Merchant Quality

(6 to 8 gage)	An'ld Galv.
Ala.City,Ala. R2	8.65 9.20**
Aliquippa J5	....8.65 9.325§
Atlanta(48) A11	..8.75 9.425*
Bartonville(48) K4	8.75 9.425
Buffalo W12	....8.65 9.20†
Cleveland A7	....8.65 ....
Crawfordsville M8	8.75 9.425
Donora,Pa. A7	..8.65 9.20†
Duluth A7	.....8.65 9.20†
Fairfield T2	.....8.65 9.20†
Houston(48) S5	.8.90 9.45**
Jacks'ville,Fla. M8	9.00 9.675
Johnstown B2(48)	8.65 9.325§
Joliet,Ill. A7	....8.65 9.20†
Kans.City(48) S5	8.90 9.45**
Kokomo C16	.....8.75 9.30†
LosAngeles B3	..9.60 10.275§
Minnequa C10	..8.90 9.45**
Monessen P7(48)	..8.65 9.25*
Palmer,Mass. W12	8.95 9.50†
Pitts.,Calif. C11	..9.60 10.15†
Rankin,Pa. A7	..8.65 9.20†
S.Chicago R2	...8.65 9.20**
S.SanFran. C10	..9.60 10.15**
Spar'wsPt.B2(48)	8.75 9.425§
Sterling(48) N15	.8.90 9.575§
Sterling(1)(48)	..8.80 9.475§
Struthers,O.(48Y1	8.65 9.30‡
Worcester,Mass.A7	8.95 9.50†

Based on zinc price of: *13.50. †5c. §10c. ‡Less than 10c. ††10.50c. **Subject to zinc equalization extras.

FASTENERS

(Base discounts, full container quantity, per cent off list, f.o.b. mill)

BOLTS

Carriage, Machine Bolts

Full Size Body (cut thread)

½ in. and smaller:	
6 in. and shorter....	49.0
Longer than 6 in. ..	39.0
⅝ in. thru 1 in.:	
6 in. and shorter...	39.0
Longer than 6 in. ..	35.0
1¼ in. and larger:	
All lengths	35.0

Undersized Body (rolled thread)

½ in. and smaller:	
6 in. and shorter..	49.0

Carriage, Machine, Lag Bolts

Hot Galvanized:

½ in. and smaller:	
6 in. and shorter..	29.0
Longer than 6 in. ..	15.0
⅝ in. and larger:	
All lengths	12.0

Lag Bolts (all diam.)

6 in. and shorter..	49.0
Longer than 6 in. ..	39.0

Plow and Tap Bolts

½ in. and smaller by 6 in. and shorter	49.0
Larger than ½ in. or Longer than 6 in. ..	39.0
Blank Bolts	39.0
Step, Elevator, Tire Bolts	49.0

Stove Bolts, Slotted:

⅛ to ¼ in. incl., 3 in. and shorter.	55.0
⅛ to ½ in., inclusive	55.0

NUTS

Reg. & Heavy Square Nuts:

All sizes	55.5

Square Nuts, Reg. & Heavy, Hot Galvanized:

All sizes	41.0

Hex Nuts, Reg. & Heavy, Hot Pressed:

¾ in. and smaller..	60.5
⅞ in. to 1 in., incl.	55.5
1⅛ in. to 1½ in., incl.	58.5
1⅝ in. and larger..	53.5

Hex Nuts, Reg. & Heavy, Cold Punched:

¾ in. and smaller..	60.5
⅞ in. to 1½ in., incl.	55.5
1⅝ in. and larger..	53.5

Hex Nuts, All Types, Hot Galvanized:

¾ in. and smaller..	46.5
⅞ in. to 1 in., incl.	41.5
1⅛ in. to 1½ in., incl.	46.5

Hex Nuts, Semifinished, Heavy (Incl. Slotted):

¾ in. and smaller..	60.5
⅞ in. to 1½ in., incl.	55.5
1⅝ in. and larger..	53.5

Hex Nuts, Finished (Incl. Slotted and Castellated):

1 in. and smaller..	63.0
1⅛ in. to 1½ in., incl.	59.0
1⅝ in. and larger..	53.5

Semifinished Hex Nuts, Reg. (Incl. Slotted):

⅝ in. and smaller..	60.5
¾ in. to 1 in., incl.	63.0
1⅛ in. to 1½ in., incl.	59.0
1⅝ in. and larger..	53.5

CAP AND SETSCREWS

(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Capscrews, Coarse or Fine Thread, Bright:

6 in. and shorter:

⅝ in. and smaller..	40.0
¾, ⅞, and 1 in. diam.	22.0
Longer than 6 in.:	
⅝ in. and smaller..	8.0
¾, ⅞, and 1 in. diam.	+6.0

High Carbon, Heat Treated:

6 in. and shorter:

⅝ in. and smaller..	26.0
¾, ⅞, and 1 in. diam.	3.0
Longer than 6 in.:	
⅝ in. and smaller..	+13.0
¾, ⅞, and 1 in. diam.	+32.0

Flat Head Capscrews:

¾ in. and smaller..	+76.0

Setscrews, Square Head, Cup Point, Coarse Thread:

Through 1 in. diam.:

6 in. and shorter..	Net
Longer than 6 in...	+23

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in., larger 12.25

⅞ in. under: List less 19%

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	25.98	23.54
1¼	13	....	30.78	23.36
1½	13	29.03	34.01	25.83
1¾	13	34.29	40.18	30.51
2	13	38.44	45.05	34.20
2¼	13	43.29	50.75	38.52
2½	12	46.99	55.06	41.81
2¾	12	51.76	60.65	46.05
2¾	12	56.04	65.67	49.88
3	12	59.76	70.03	53.19

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Tee Rails All No. 2	Tee Rails 60 lb Under
Rails				
Bessemer,Pa. U5	5.525	5.425	....	6.50
Ensley,Ala. T2	5.525	5.425	....	6.50
Fairfield,Ala. T2	....	....	....	6.50
Gary,Ind. U5	5.525	5.425	....	....
Huntington,W.Va. C15	....	....	....	6.50
IndianaHarbor,Ind. I-2	5.525	5.425	5.475	....
Johnstown,Pa. B2	....	....	...(16)	6.50
Lackawanna,N.Y. B2	5.525	5.425	....	6.50
Minnequa,Colo. C10	5.525	5.425	....	7.00
Steelton,Pa. B2	5.525	5.425	....	....
Williamsport,Pa. S19	....	....	....	6.50

TIE PLATES

Fairfield,Ala. T2	.....6.60
Gary,Ind. U5	.....6.60
Ind.Harbor,Ind. I-2	....6.60
Lackawanna,N.Y. B2	...6.60
Minnequa,Colo. C10	....6.60
Seattle B3	.....6.75
Steelton,Pa. B2	.....6.60
Torrance,Calif. C11	....6.75

JOINT BARS

Bessemer,Pa. U5	.....6.975
Fairfield,Ala. T2	.....6.975
Ind.Harbor,Ind. I-2	...6.975
Joliet,Ill. U5	.....6.975
Lackawanna,N.Y. B2	..6.975
Minnequa,Colo. C10	...6.975
Steelton,Pa. B2	.....6.975

AXLES

Ind.Harbor,Ind. S13	...8.775
Johnstown,Pa. B2	....8.775

TRACK BOLTS, Untreated

Cleveland R2	.....14.75
KansasCity,Mo. S5	....14.75
Lebanon,Pa. B2	.....14.75
Minnequa,Colo. C10	...14.75
Pittsburgh P14	.....14.75
Seattle B3	.....15.25

SCREW SPIKES

Lebanon,Pa. B2	.....14.50

STANDARD TRACK SPIKES

Fairfield,Ala. T2	.....9.75
Ind.Harbor,Ind. I-2, Y1	9.75
KansasCity,Mo. S5	....9.75
Lebanon,Pa. B2	.....9.75
Minnequa,Colo. C10	....9.75
Pittsburgh J5	.....9.75
Seattle B3	.....10.25
S.Chicago,Ill. R2	.....9.75
Struthers,O. Y1	.....9.75
Youngstown R2	.....9.75

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 13 Ga. and heavier.
(9) Merchant quality; and 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) Plus 1c per 100 lb.
(21) New Haven, Conn. base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.15c, finer than 15 Ga.
(25) Bar mill bands.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅜ in.; 7.60c, for widths ⅜ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.685c.
(43) 9-14½ Ga.
(44) To fabricators.
(45) 0.022 in. and lighter, over 0.022", 8.26c.
(48) 6-7Ga.
(49) 3½ in. and smaller rounds; 9.30c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25
Ambridge, Pa. N2	+9.25	....	+2.75	....	+0.25	....	1.25	....	1.25	....	1	....	3.5	....
Lorain, O. N3	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25
Youngstown Y1	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25

ELECTRIC STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Alton, Ill. L1	....	....	....	....	....	....	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Benwood, W. Va. W10	4.5	+22	+7.5	+31	+18	+39.5	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Butler, Pa. F6	5.5	+21	+6.5	+30	+17	+38.5	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Fairless, Pa. N3	....	....	....	....	....	....	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Fontana, Calif. K1	....	....	....	....	....	....	+8.25	+23.5	+5.25	+19.5	+1.75	+15	0.75	+14.25
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	4.25	+11	7.25	+7	10.75	+2.5	13.25	+3.25
Lorain, O. N3	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Sharon, Pa. S4	5.5	+21	+6.5	+30	+17	+38.5	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Sparrows Pt., Md. B2	3.5	+23	+8.5	+32	+19	+40.5	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Wheatland, Pa. W9	5.5	+21	+6	+30	+17	+38.5	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Youngstown R2, Y1	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Alton, Ill. L1	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	....	....	....	....
Benwood, W. Va. W10	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Etna, Pa. N2	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Fairless, Pa. N3	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	4.25	+12.5	4.25	+12.5
Fontana, Calif. K1	1.25	+13.25	1.75	+12.75	3.25	+13	3.25	+13	+7.25	+24	+7.25	+24
Indiana Harbor, Ind. Y1	13.75	+0.75	14.25	+0.25	15.75	+0.5	15.25	+0.5	5.25	+11.5	5.25	+11.5
Lorain, O. N3	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Sharon, Pa. M6	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Sparrows Pt., Md. B2	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	4.25	+12.5	4.25	+12.5
Wheatland, Pa. W9	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Youngstown R2, Y1	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5

*Galvanized pipe discounts based on current price of zinc (10.00c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	Wire Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.00	27.00	....	36.00	....	42.00	44.25	48.50	45.00
202	23.25	30.25	36.50	39.00	40.75	43.00	45.00	49.25	49.25
301	23.25	28.00	37.25	37.25	42.00	44.25	46.25	51.25	47.50
302	25.25	31.50	38.00	40.50	42.75	45.00	47.25	52.00	52.00
302B	25.50	32.75	40.75	45.75	45.00	47.25	49.50	57.00	57.00
303	....	32.00	41.00	....	45.50	48.00	50.00	56.75	56.75
304	27.00	33.25	40.50	44.25	45.25	47.75	50.75	55.50	55.50
304L	....	....	48.25	51.50	53.00	55.50	58.50	63.25	63.25
305	28.50	36.75	42.50	47.50	45.25	47.75	51.25	58.75	58.75
308	30.75	38.25	47.25	50.25	52.75	55.75	60.25	63.00	63.00
309	39.75	49.50	57.75	64.50	63.75	67.00	71.00	80.50	80.50
310	49.75	61.50	78.00	84.25	86.50	91.00	92.75	96.75	96.75
314	....	....	....	....	86.50	....	92.75	....	104.50
316	39.75	49.50	62.25	69.25	69.25	73.00	76.75	81.50	81.50
316 L	....	....	70.00	76.50	77.00	80.75	84.50	89.25	89.25
317	48.00	60.00	76.75	88.25	86.25	90.75	93.50	101.00	101.00
321	32.25	40.00	47.00	53.50	52.50	55.50	59.75	65.50	65.50
330	....	....	106.75	....	106.75	106.75	105.50	108.00	149.25
18-8 CbTa	37.00	46.50	55.75	63.50	61.50	64.75	69.75	79.25	79.25
403	....	....	32.00	....	35.75	37.75	40.25	48.25	48.25
405	19.50	25.50	29.75	36.00	33.50	35.25	37.50	46.75	46.75
410	16.75	21.50	28.25	31.00	32.00	33.75	35.00	40.25	40.25
416	....	....	28.75	....	32.50	34.25	36.25	48.25	48.25
420	....	33.50	34.25	41.75	39.25	41.25	45.25	62.00	62.00
430	17.00	21.75	28.75	32.00	32.50	34.25	36.00	40.75	40.75
430F	....	....	29.50	....	33.00	34.75	36.75	51.75	51.75
431	....	28.75	37.75	....	42.00	44.25	46.00	56.00	56.00
446	....	....	39.25	59.00	44.25	46.50	47.75	70.00	70.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co., Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McInnes Steel Co.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steels Inc.; U. S. Steel Corp.; Universal-Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel Co., subsidiary of Allegheny Ludlum Steel Corp.; Washington Steel Corp.

Clad Steel

	Plates 5%	Plates Carbon Base 10%	Plates Carbon Base 15%	Plates Carbon Base 20%	Sheets Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	34.70	37.95	42.25	46.70	40.00
304L	36.90	40.55	45.10	49.85	....
316	40.35	44.40	49.50	54.50	58.75
316L	45.05	49.35	54.70	60.10	....
316 Cb	47.30	53.80	61.45	69.10	....
321	36.60	40.05	44.60	49.30	47.25
347	38.25	42.40	47.55	52.80	57.00
405	28.60	29.85	33.35	36.85	....
410	28.15	29.55	33.10	36.70	....
430	28.30	29.80	33.55	37.25	....
Inconel	48.90	59.55	70.15	80.85	....
Nickel	41.65	51.95	62.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....
Copper*	....	....	....	....	46.00

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
Copper*	33.95	40.25

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.305	Cr-Hot Work	0.475
Extra Carbon	0.360	W-Cr Hot Work	0.500
Special Carbon	0.475	V-Cr Hot Work	0.520
Oil Hardening	0.475	Hi-Carbon-Cr	0.925

Grade by Analysis (%) W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	....	4.285
18.25	4.25	1	4.75	....	2.500
18	4	2	9	....	2.870
18	4	2	....	....	1.960
18	4	1	....	....	1.795
9	3.5	..	....	....	1.395
13.5	4	3	....	....	2.060
13.75	3.75	2	5	....	2.440
6.4	4.5	1.9	....	5	1.300
6	4	3	....	6	1.545
1.5	4	1	....	8.5	1.155

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal transportation tax.

Birmingham District	Basic	No. 2 Foundry	Malle-able	Besse-mer
AlabamaCity,Ala. R2	62.00	62.50	....	....
Birmingham R2	62.00	62.50‡	....	....
Birmingham U6	....	62.50‡	66.50	....
Woodward,Ala. W15	62.00**	62.50‡	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N.Tonawanda,N.Y. T9	....	66.50	67.00	67.50
Tonawanda,N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester,N.Y., deld.	69.02	69.52	70.02	....
Syracuse,N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago,Ill. R2	66.00	....	66.50	....
S.Chicago,Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	68.62	69.12	69.12	69.62
Muskegon,Mich., deld.	....	74.12	74.12	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron,Ohio, deld.	69.12	69.62	69.62	70.12
Mid-Atlantic District				
Birdsboro,Pa. B10	68.00	68.50	69.00	69.50
Chester,Pa. P4	66.50	67.00	67.50	....
Swedeland,Pa. A3	68.00	68.50	69.00	69.50
NewYork, deld.	....	75.10	75.60	....
Newark,N.J., deld.	72.29	72.79	73.29	73.79
Philadelphia, deld.	70.01	70.51	71.01	71.59
Troy,N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland,Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks,Pa., deld.	....	67.60	67.60	68.13
Lawrenceville,Homestead, Wilmerding,Monaca,Pa., deld.	....	68.26	68.26	68.79
Verona,Trafford,Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge,Pa., deld.	68.60	69.10	69.10	69.63
Midland,Pa. C18	66.00	....	....	....

Youngstown District	Basic	No. 2 Foundry	Malle-able	Besse-mer
Hubbard,Ohio Y1	....	....	66‖50	....
Sharpsville,Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	67.00
Mansfield,Ohio, deld.	70.90	....	71.40	71.90
Duluth I-3	66.00	66.50	66.50	67.00
Erie,Pa. I-3	66.00	66.50	66.50	67.00
Everett,Mass. E1	67.50	68.00	68.50	....
Fontana,Calif. K1	75.00	75.50	....	....
Geneva,Utah C11	66.00	66.50	....	....
GraniteCity,Ill. G4	67.90	68.40	68.90	....
Ironton,Utah C11	66.00	66.50	....	....
Minnequa,Colo. C10	68.00	68.50	69.00	....
Rockwood,Tenn. T3	....	62.50‡	66.50	....
Toledo,Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.54	73.04	....	....

**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
‡Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,Ohio I-3, J1	78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$99.00
NiagaraFalls,N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry. $9 freight allowed K2	103.50
Keokuk,Iowa O.H. & Fdry. 12½ lb piglets, 16% Si, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$78.50
Troy,N.Y. R2 (Phos. 0.035% max)	74.00
Philadelphia, deld.	82.27
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Warehouse Steel Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Atlanta	8.59§	9.86§	....	....	8.64	9.01	10.68	....	9.05	8.97	10.90
Baltimore	8.28	8.88	9.61	....	8.76	9.06	11.34#	15.18	9.19	8.66	10.14
Birmingham	8.18	9.45	11.07	....	8.23	8.60	10.57	....	8.64	8.56	10.70
Boston	9.38	10.44	11.45	53.50	9.42	9.73	12.90#	15.28	9.63	9.72	11.20
Buffalo	8.40	9.00	10.07	55.98	8.50	8.80	10.90#	15.00	8.90	8.90	10.45
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10.46	....	8.88	8.80	10.66
Chicago	8.20	9.45	10.00	53.00	8.23	8.60	8.80	14.65	8.64	8.56	9.88
Cincinnati	8.34	9.48	10.05	52.43	8.54	8.92	9.31	14.96	9.18	8.93	10.21
Cleveland	8.18	9.45	9.95	55.68	8.33	8.69	10.80#	14.74	9.01	8.79	10.11
Dallas	8.85	10.15	....	....	9.00	8.95	11.01	....	9.00	9.45	10.70
Denver	9.38	11.75	....	....	9.41	9.78	11.10	....	9.82	9.74	11.06
Detroit	8.43	9.70	10.35	56.50	8.58	8.90	9.15	14.91	9.18	8.91	10.13
Erie, Pa.	8.20	9.45	9.95[10]	....	8.50	8.75	9.05[10]	....	9.00	8.85	10.10
Houston	8.45	9.75	8.45	....	8.60	8.55	11.10	....	8.60	9.05	10.30
Jackson, Miss.	8.52	9.79	....	....	8.57	8.94	10.68	....	8.97	8.90	10.74
Los Angeles	7.85	10.75	11.65	57.60	7.90	7.90	12.10	....	7.95	7.90	10.05
Milwaukee	8.33	9.58	10.13	....	8.36	8.73	9.03	14.78	8.85	8.69	10.01
Moline, Ill.	8.55	9.80	10.35	....	8.58	8.95	9.15	....	8.99	8.91	....
New York	8.87	10.13	10.56	53.08	9.31	9.57	12.76#	15.09	9.35	9.43	10.71
Norfolk, Va.	8.05	....	....	....	8.55	8.60	10.80	....	8.95	8.45	9.95
Philadelphia	8.00	8.90	9.87	51.94	8.69	8.65	11.51#	15.01	8.50	8.77	9.77**
Pittsburgh	8.18	9.45	10.35	52.00	8.33	8.60	10.80#	14.65	8.64	8.56	9.88
Portland, Oreg.	8.50	11.20	11.55	57.38	9.55	8.65	14.65#	15.95	8.65	8.30	11.50
Richmond, Va.	8.45	....	10.40	....	9.15	9.15	....	....	9.40	8.85	10.35
St. Louis	8.54	9.79	10.36	....	8.59	8.97	9.41	15.01	9.10	8.93	10.25
St. Paul	8.79	10.04	10.61	....	8.84	9.21	9.66	....	9.38	9.30	10.49
San Francisco	9.35	10.75	11.00	55.10	9.45	9.70	13.00	16.10	9.50	9.60	12.00
Seattle	9.95	11.15	12.00	57.38	10.00	10.10	14.05	16.35	9.80	9.70	12.10
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	9.95	11.15	12.00	57.38	10.00	10.10	14.05	17.20	9.80	9.70	12.10
Washington	8.48	9.58	....	....	9.06	9.15	9.73	....	9.35	8.86	10.36

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **⅛ in. and heavier; ††as annealed; ‡‡over 4 in.; §§over 3 in.; #1 in. round C-1018.

Base quantities, 2000 to 4999 lb except as noted; cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb, and in Los Angeles, 6000 lb and over; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, Portland, Oreg. 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Portland, Oreg., 1000 to 9999 lb; [3]—400 to 9999 lb; [5]—1000 to 1999 lb; [8]—2000 to 3999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., $135; Salina, Pa., $140; Niles, Ohio, $138; Cutler, Utah, $165.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Pa., New Savage, Md., St. Louis, $175; Stevens Pottery, Ga., $185; Cutler, Utah, $233.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., $150; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $155; E. Chicago, Ind., Joliet, Rockdale, Ill., $160; Lehigh, Utah, $175; Los Angeles, $180.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $157; Morrisville, Hays, Latrobe, Pa., $160; E. Chicago, Ind., $167; Curtner, Calif., $182.

Semisilica Brick (per 1000)

Clearfield, Pa., $140; Philadelphia, $137; Woodbridge, N. J., $135.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $235; Danville, Ill., $238; Philadelphia, Clearfield, Pa., $230; Orviston, Pa., $245.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $295; Danville, Ill., $298; Philadelphia, Clearfield, Orviston, Pa., $305.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $335; Danville, Ill., $338; Philadelphia, Clearfield, Orviston, Pa., $345.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $188.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.

Magnesite (per net ton)

Domestic, dead-burned, bulk ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜ in. grains with fines: Baltimore, $73.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-41; 70%, $36.40; 60%, $33-36.50. Imported, net tons, f.o.b. cars point of entry, duty paid, metallurgical grade: European, $33-34; Mexican, all rail, duty paid, $25.25-25.75; barge, Brownsville, Tex., $27.25-27.75.

Ores

Lake Superior Iron Ore

(Prices effective for the 1957 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos.	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 30, 1957, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, foundry and basic 62-64% concentrates	25.00-27.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	27.00-27.50
N. African hematite (spot)	nom.
Brazilian iron ore, 68-69%	28.00

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	$13.00-14.00*
Domestic, concentrates f.o.b. milling points	20.00-22.00

*Before duty.

Manganese Ore

Mn 46-48%, Indian (export tax included), $1.39-1.42 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; other than Indian, nominal; contracts by negotiation.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$51.00-53.00
48% 2.8:1	48.00-50.00
48% no ratio	41.00-43.00

South African Transvaal

48% no ratio	$40.00-41.00
44% no ratio	30.00-30.50

Turkish

48% 3:1	$55.00-57.00

Domestic

Rail nearest seller

18% 3:1	$39.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.18

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

55-60%	$2.50-2.60
60-65%	2.60-2.90

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, Swedish: Deld. east of Mississippi River, ocean bags 23,000 lb and over.. F.o.b. Riverton or Camden, N. J., west of Mississippi River.	10.50 9.50
Sponge Iron, Domestic, 98 + % Fe: Deld. east of Mississippi River, 23,000 lb and over F.o.b. Riverton, N. J., west of Mississippi River	10.50 9.50
Electrolytic Iron: Melting stock, 99.9% Fe, irregular fragments of ⅛ in. x 1.3 in.	28.00
Annealed, 99.5% Fe..	36.50
Unannealed† (99 + % Fe)	36.00
Unannealed (99 + % Fe) (minus 325 mesh)	59.00
Powder Flakes (minus 16, plus 100 mesh)..	29.00
Carbonyl Iron: 98.1-99.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh.	
Aluminum: Atomized, 500 lb drum, freight allowed Carlots ..... Ton lots	39.50 41.50
Antimony, 500 lb lots	42.00*
Brass, 5000-lb lots	31.30-38.40†
Bronze, 5000-lb lots	48.10-52.70†
Copper: Electrolytic ..... Reduced	14.25* 14.25*
Lead	7.50*
Manganese: Minus 35 mesh .... Minus 100 mesh .... Minus 200 mesh	64.00 70.00 75.00
Nickel, unannealed ..	$1.065
Nickel-Silver, 5000-lb lots	49.20-61.30†
Phosphor-Copper, 5000-lb lots	59.80
Copper (atomized) 5000-lb lots	40.30-48.80‡
Silicon	47.50
Solder	7.00*
Stainless Steel, 304 ..	$1.62
Stainless Steel, 316 ..	$1.20
Tin	14.50*
Zinc, 5000-lb lots	17.50-30.70‡
Tungsten: Melting grade, 99% 60 to 200 mesh: 1000 lb and over.. Less than 1000 lb ..	Dollars 3.15 3.30
Chromium, electrolytic 99.8% Cr min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

——Inches—— Diam	Length	Per 100 lb
2	24	$60.75
2½	30	39.25
3	40	37.00
4	40	35.00
5⅛	40	34.75
6	60	31.50
7	60	28.25
8, 9, 10	60	28.00
12	72	26.75
14	60	26.75
16	72	25.75
17	60	26.25
18	72	26.25
20	72	25.25
24	84	26.00

CARBON

8	60	13.30
10	60	13.00
12	60	12.95
14	60	12.85
14	72	11.95
17	60	11.85
17	72	11.40
20	84	11.40
20	90	11.00
24	72, 84	11.25
24	96	10.95
30	84	11.05
40, 35	110	10.70
40	100	10.70

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace	$14.75-15.75
Connellsville, Pa., foundry	18.00-18.50

Oven Foundry Coke

Birmingham, ovens	$28.85
Cincinnati, deld.	31.84
Buffalo, ovens	30.50
Camden, N. J., ovens	29.50
Detroit, ovens	30.50
Pontiac, Mich., deld.	32.25
Saginaw, Mich., deld.	33.83
Erie, Pa., ovens	30.50
Everett, Mass., ovens: New England, deld.	31.55*
Indianapolis, ovens	29.75
Ironton, Ohio, ovens	29.00
Cincinnati, deld.	31.84
Kearny, N. J., ovens	29.75
Milwaukee, ovens	30.50
Neville Island (Pittsburgh), Pa., ovens	29.25
Painesville, Ohio, ovens	30.50
Cleveland, deld.	32.69
Philadelphia, ovens	29.50
St. Louis, ovens	31.50
St. Paul, ovens	29.75
Chicago, deld.	33.24
Swedeland, Pa., ovens	29.50
Terre Haute, Ind., ovens	29.75

*Or within $4.85 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	36.00
Toluene, one deg.	29.50
Industrial xylene	32.00-34.00

Per ton, bulk, ovens

Ammonium sulfate	$32.00-34.00

Cents per pound, producing point

Phenol: Grade 1, 17.50; Grade 2-3, 15.50; Grade 4, 17.50; Grade 5, 16.50; Grade 6, 14.50.

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305...	$5.68	$5.63	$5.68	$5.93
Bar Size Angles	5.89	5.93	5.98	6.23
Structural Angles	5.98	5.93	5.98	6.23
I-Beams	6.43	6.39	6.43	6.68
Channels	6.43	6.39	6.43	6.68
Plates (basic bessemer)	7.64	7.59	7.64	7.88
Sheets, H.R.	8.25	8.20	8.20	8.50
Sheets, C.R. (drawing quality)	9.00	8.95	8.95	9.25
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	26.79	26.67	26.67	27.36
Barbed Wire (†)	6.95	6.95	6.95	7.40
Merchant Bars	6.37	6.32	6.37	6.61
Hot-Rolled Bands	7.20	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	6.73	6.73	6.73	7.13
Wire Rods, O.H. Cold Heading Quality No. 5	7.07	7.07	7.07	7.47
Bright Common Wire Nails ($)	8.12	8.12	8.12	8.32

†Per 82 lb. net, reel. $Per 100-lb kegs, 20d nails and heavier.

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx). Base price per net ton; $245, Johnstown, Duquesne, Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74% respectively. (Mn 79-81%). Lump $253 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-90%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn, packed, carload 26.8c, ton lot 28.4c, less ton 29.6c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2%). Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lot 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, 34c; 2000 lb to min carload, 36c; 500 lb to 1999 lb, 38c; 50 lb cans, add 0.5c per lb. Preminum for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2% from above prices. For 3% C grade Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38.43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $200 per ton ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $225 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l. lump, bulk 28.75c per lb of contained Cr; c.l. packed 30.30c, ton lot 32.05c; less ton 33.45c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 36.75c per lb contained Cr; 0.010% max, 37.75c. Ton lot, add 3.5c; less ton, add 5.2c. Delivered.
Cr 67.71%, carload, lump, bulk, C 0.02% max, 41.00c per lb contained Cr; 0.025% max, 39.75c; 0.05% max, 39.00c; 0.10% max, 38.50c; 0.20% max, 38.25c; 0.50% max, 38.00c; 1.0% max, 37.75c; 1.5% max, 37.50c; 2.0% max, 37.25c. Ton lot, add 3.4c; less ton lot, add 5.1c. Delivered.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). Contract, c.l., 2 in. x D, bulk 30.05c per lb of contained Cr. Packed, c.l. 31.65c, ton 33.45c, less ton 34.95c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8M x D, 21.25c, per lb of alloy, ton lot 22.50c; less ton lot 23.70c. Delivered. Spot, add 0.25c.

Ferrochrome-Silicon: Cr 39-41%, Si 42-45%, C 0.05% max or Cr 33-36%, Si 45-48%, C 0.05% max. Carload, lump, bulk, 3" x down and 2" x down, 27.50c per lb contained Cr, 14.20c per lb contained Si. 0.75" x down, 28.65c per lb contained Cr, 14.20c per lb contained Si. Delivered.

Chromium Metal Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed 2" x D plate (about ¼" thick) $1.29 per lb, ton lot $1.31, less ton lot $1.33. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55%, or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.50 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si. Packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 14.20c per lb of contained Si. Packed c.l. 16.70c, ton lot 18.15c, less ton 19.80c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 15.25c per lb contained silicon. Packed, c.l. 17.25c, ton lot 19.05c; less ton 20.4c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 16.4c per lb of contained Si. Packed, c.l. 18.30c, ton lot 19.95c, less ton 21.2c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 19.5c per lb of contained Si. Packed, c.l. 21.15c, ton lot 22.55c, less ton 23.6c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 0.75% max Fe, 0.07% max Ca). C.l. lump, bulk, 22.00c per lb of Si. Packed, c.l. 23.65c, ton lot 24.95c, less ton 25.95c. Add 0.5c for max 0.03% Ca grade. Deduct 0.5c for max 1% Fe grade analyzing min 99.75% Si; 0.75c for max 1.25% Fe grades analyzing min 96.75% Si. Spot, add 0.25c.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 10.65c per lb of alloy; ton lot, packed, 11.8c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35%-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 27.25c per lb of alloy, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Bortam: (B 1.5-1.9%). Ton lot, 45c per lb; less than ton lot, 50c per lb.

Carbortam: (B 1 to 2%). Contract, lump, carload 9.50c, per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3¾ lb each and containing 2 lb of Cr). Contract, carload, bulk 19.60c per lb of briquet, carload packed in box pallets 19.80c, in bags 20.70c; 3000 lb to c.l. in box pallets 21.00c; 2000 lb to c.l. in bags, 21.90c; less than 2000 lb in bags 22.80c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Contract, carload, bulk 14.8c per lb of briquet; c.l., packed, pallets 15c, bags 16c; 3000 lb to c.l., pallets 16.2c; 2000 lb to c.l., bags, 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). Contract, c.l. bulk 15.1c per lb of briquet; c.l. packed, pallets, 15.3c; bags 16.3c, 3000 lb to c.l., pallets, 16.5c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si). Contract, carload, bulk 7.7c per lb of briquet; packed, pallets, 7.9c; bags 8.9c; 3000 lb to c.l.; pallets 9.5c; 2000 lb to c.l. bags 10.5c; less ton 11.4c. Delivered. Spot, add 0.25c; (Small size—weighing approx 2½ lb and containing 1 lb of Si.) Carload, bulk 7.85c. Packed, pallets 8.05c; bags 9.0bc; 3000 lb to c.l. pallets 9.65c; 2000 lb to c.l., bags, 10.65c; less ton 11.55c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.41 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $2.95 per lb of contained W; 2000 lb W to 5000 lb W, $3.05; less than 2000 lb W, $3.17. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8 % max, C 0.4% max). Contract, ton lot 2" x D, $4.90 per lb of contained Cb. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lot 2" x D, $4.25 per lb of contained Cb plus Ta, delivered; less ton lot $4.30.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5.7%, Fe 20% approx). Contract, c.l. packed ½-in. x 12 M 20.00c per lb of alloy, ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

Graphidox No. 5: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 19c per lb of alloy, ton lot 20.15c; less ton lot 21.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.1c per lb of alloy; ton lot 19.55c; less ton lot 20.8c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 18.50c. Packed c.l. 19.50c, 2000 lb to c.l. 20.50c, less than 2000 lb 21c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carload, f.o.b. sellers' works. Mt. Pleasant, Siglo, Tenn., $110 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo, in 200-lb container, f.o.b. Langeloth and Washington, Pa. $1.68 in all sizes except powdered which is $1.74.

Technical Molybdic-Oxide: Per lb of contained Mo, in cans, $1.39; in bags, $1.38, f.o.b. Langeloth and Washington, Pa.

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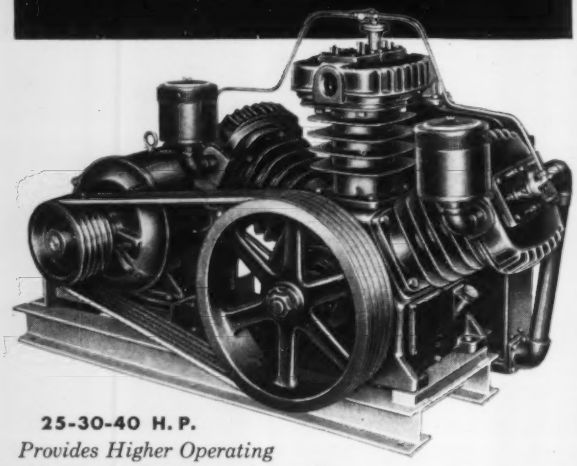

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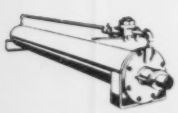

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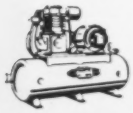

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Scrap Advance Is First in Months

Sharp rise in East puts STEEL's composite on the prime steel mill grade up $1.17 a ton to $33.17. Firmer tone developing at some other points despite continued sag in ingot operations

Scrap Prices, Page 110

Cleveland—Holiday steel plant curtailments here and in adjoining areas will intensify the sluggishness in the local scrap market. There is no buying, and representative sales are not anticipated until early next year.

Automotive lists will begin to come out this week—one is scheduled to be closed Dec. 23 and another Dec. 27. Indications are tonnage will be smaller than that offered in the lists at the end of November.

Prices are unchanged but are nominal. Signs of returning market strength are not in evidence.

Washington—Domestic stocks of ferrous materials (scrap and pig iron) at the end of October totaled 11,439,000 gross tons, a new high, reports the U. S. Bureau of Mines. Of the total, 8,135,000 tons were scrap and 3,304,000 tons pig iron.

Domestic consumption during October was 5,338,000 tons of scrap and 5,670,000 tons of pig iron. The total melt (11,008,000 tons) consisted of 48 per cent scrap and 52 per cent pig iron, compared with 47 per cent scrap and 53 per cent iron in September.

Scrap available for consumption in the month (home production plus purchases) amounted to 5,531,000 gross tons, an increase of 1 per cent over the September figure. Home scrap accounted for 3,389,000 tons and purchases 2,142,000. Of the purchased scrap, 84 per cent was received from dealers and 16 per cent from other sources.

SCRAP AND PIG IRON STATISTICS, 1957
(Gross tons)

Months	Consumption Scrap	Consumption Pig Iron	Consumers' Stocks End of October Scrap	Consumers' Stocks End of October Pig Iron
January	6,630,804	6,482,472	6,528,135	2,024,625
February	6,038,436	5,860,099	6,523,035	2,000,821
March	6,294,038	6,155,334	6,572,422	2,177,658
April	5,816,309	5,856,587	6,586,114	2,253,929
May	5,753,435	5,862,966	6,524,031	2,420,139
June	5,430,607	5,672,086	6,525,916	2,491,952
July	4,897,752	5,558,702	7,023,107	2,878,719
August	5,299,543	5,769,995	7,493,892	3,086,853
September	5,033,998	5,645,036	7,941,835	3,242,471
October	5,338,000	5,670,000	8,135,000	3,304,000

Philadelphia—Sales of No. 1 heavy melting, No. 2 bundles, and heavy turnings have been made at higher prices. Although the tonnage bought is not heavy, two consumers paid $37 for No. 1 heavy melting, up $3.50 a ton. Sales of No. 2 bundles at $27 and heavy turnings at $31, are advances of $2.50 and $1.50. No. 2 heavy melting is quoted at $32.50. Yard intake has dwindled.

New York—Although brokers' buying prices are generally unchanged, steel scrap has firmed up, or at least is steadier. The market decline appears to have been arrested. Railroad scrap lists in the East this month are bringing slightly better prices for the primary steel grades. Stainless scrap is depressed, and 18-8 sheets, clips, and solids are down at least $5 a ton.

Pittsburgh—Lacking sales, and with holiday curtailments just ahead, the scrap market here is lifeless. Prices are unchanged but nominal. Not much change in market conditions is expected the remainder of this year. Some pickup is anticipated in January.

Cincinnati—There is little buying interest in scrap here. Area mills have ample supplies and are not increasing their inventories. Some foundry scrap is moving by water to a distant buyer. Short rails are off $2 to $52-$53, and random rails dipped $1 to $42-$43 on an isolated sale.

Chicago—Scrap has developed a firmer tone. The stronger note is principally in the railroad and cast iron grades. The most likely explanation is notice from a large consumer that tonnage not delivered by yearend against orders placed prior to December would be canceled. Since shipments are accepted on a broker quota basis, it is thought unlikely that all shipments can be completed by Dec. 31.

The $1 to $2 a ton rise in cast scrap prices is attributed to the fact inventories were allowed to get too low. The foundry melt continues mostly on a 32-hour week basis. The district steel rate holds at 75 per cent, but there is little likelihood of a pickup before the turn of the year.

(*Please turn to Page* 115)

Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL, Dec. 18, 1957. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Dec. 18	$33.17
Dec. 11	32.00
Nov. Avg.	33.17
Dec. 1956	64.29
Dec. 1952	43.00

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	31.00-32.00
No. 2 heavy melting	29.00-30.00
No. 1 factory bundles	34.00-35.00
No. 1 dealer bundles	31.00-32.00
No. 2 bundles	28.00-29.00
No. 1 busheling	31.00-32.00
Machine shop turnings	15.00-16.00
Mixed borings, turnings	15.00-16.00
Short shovel turnings	19.00-20.00
Cast iron borings	19.00-20.00
Cut structurals:	
2 ft and under	35.00-36.00
3 ft lengths	34.00-35.00
Heavy turnings	30.00-31.00
Punchings & plate scrap	34.00-35.00
Electric furnace bundles	34.00-35.00

Cast Iron Grades

No. 1 cupola	39.00-40.00
Stove plate	33.00-34.00
Unstripped motor blocks	26.00-27.00
Clean auto cast	42.00-43.00
Drop broken machinery	51.00-52.00

Railroad Scrap

No. 1 R.R. heavy melt.	*34.50-35.50*
Rails, 2 ft and under	55.00-56.00
Rails, 18 in. and under	56.00-57.00
Angles, splice bars	46.00-47.00
Rails, rerolling	56.00-57.00

Stainless Steel Scrap

18-8 bundles & solids	210.00-215.00
18-8 turnings	115.00-120.00
430 bundles & solids	95.00-100.00
430 turnings	50.00-55.00

CLEVELAND

No. 1 heavy melting	26.00-27.00
No. 2 heavy melting	20.00-21.00
No. 1 factory bundles	29.00-30.00
No. 1 bundles	26.00-27.00
No. 2 bundles	19.00-20.00
No. 1 busheling	26.00-27.00
Machine shop turnings	11.00-12.00
Short shovel turnings	15.00-16.00
Mixed borings, turnings	15.00-16.00
Cast iron borings	15.00-16.00
Cut foundry steel	33.00-34.00
Cut structurals, plates 2 ft and under	35.00-36.00
Low phos. punchings & plate	29.00-30.00
Alloy free, short shovel turnings	19.00-20.00
Electric furnace bundles	27.00-28.00

Cast Iron Grades*

No. 1 cupola	38.00-39.00
Charging box cast	33.00-34.00
Heavy breakable cast	29.00-30.00
Stove plate	36.00-37.00
Unstripped motor blocks	23.00-24.00
Brake shoes	30.00-31.00
Clean auto cast	42.00-43.00
Burnt cast	28.00-29.00
Drop broken machinery	40.00-41.00

Railroad Scrap

No. 1 R.R. heavy melt.	31.50-32.50
R.R. malleable	49.00-50.00
Rails, 2 ft and under	55.00-56.00
Rails, 18 in. and under	56.00-57.00
Rails, random lengths	48.00-49.00
Cast steel	43.00-44.00
Railroad specialties	43.00-44.00
Uncut tires	37.00-38.00
Angles, splice bars	43.00-44.00
Rails, rerolling	54.00-55.00

Stainless Steel
(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	205.00-210.00
18-8 turnings	90.00-95.00
430 clips, bundles, solids	75.00-80.00
430 turnings	40.00-50.00

*Nominal

YOUNGSTOWN

No. 1 heavy melting	29.00-30.00
No. 2 heavy melting	22.00-23.00
No. 1 bundles	29.00-30.00
No. 2 bundles	22.00-23.00
No. 1 busheling	29.00-30.00
Machine shop turnings	13.00-14.00
Short shovel turnings	17.00-18.00
Cast iron borings	17.00-18.00
Low phos.	33.00-34.00
Electric furnace bundles	33.00-34.00

Railroad Scrap

No. 1 R.R. heavy melt.	34.50-35.50

CHICAGO

No. 1 heavy mel., indus.	32.00-33.00
No. 1 hvy melt., dealer	29.00-30.00
No. 2 heavy melting	28.00-29.00
No. 1 factory bundles	35.00-36.00
No. 1 dealer bundles	*30.00-31.00*
No. 2 bundles	19.00-20.00
No. 1 busheling, indus.	32.00-33.00
No. 1 busheling, dealer	29.00-30.00
Machine shop turnings	16.00-17.00
Mixed borings, turnings	18.00-19.00
Short shovel turnings	18.00-19.00
Cast iron borings	18.00-19.00
Cut structurals, 3 ft.	*40.00-41.00*
Punchings & plate scrap	*41.00-42.00*

Cast Iron Grades

No. 1 cupola	*37.00-38.00*
Stove plate	*34.00-35.00*
Unstripped motor blocks	*29.00-30.00*
Clean auto cast	*41.00-42.00*
Drop broken machinery	*41.00-42.00*

Railroad Scrap

No. 1 R.R. heavy melt.	35.00-36.00
R.R. mallable	*45.00-46.00*
Rails, 2 ft and under	*49.00-50.00*
Rails, 18 in. and under	*50.00-51.00*
Angles, splice bars	*46.00-47.00*
Axles	*49.00-50.00*
Rails, rerolling	*49.00-50.00*

Stainless Steel Scrap

18-8 bundles & solids	*190.00-200.00*
18-8 turnings	*90.00-100.00*
430 bundles & solids	80.00-90.00
430 turnings	50.00-55.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	21.00-22.00
No. 2 heavy melting	18.00-19.00
No. 1 bundles	21.00-22.00
No. 2 bundles	18.00-19.00
No. 1 busheling	21.00-22.00
Machine shop turnings	8.00-9.00
Mixed borings, turnings	9.00-10.00
Short shovel turnings	10.00-11.00
Punchings & plate scrap	27.00-28.00

Cast Iron Grades

No. 1 cupola	31.00
Stove plate	25.00
Charging box cast	25.00
Heavy breakable	24.00
Unstripped motor blocks	15.00†
Clean auto cast	33.00
Malleable	34.00†

†Nominal

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	*35.00†*
No. 2 heavy melting	32.00
No. 1 bundles	*32.00†*
No. 2 bundles	25.00
No. 1 busheling	*35.00†*
Machine shop turnings	*14.00*
Short shovel turnings	*16.00*

Cast Iron Grades

No. 1 cupola	43.00
Charging box cast	*32.00*
Heavy breakable cast	*32.00*
Unstripped motor blocks	*32.00*
Brake shoes	40.00
Clean auto cast	43.00
Stove plate	*36.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*36.25†*
Rails, 18 in. and under	*47.00†*
Rails, random lengths	43.00
Rails, rerolling	47.00†
Angles, splice bars	43.00†

†Nominal

PHILADELPHIA

No. 1 heavy melting	*37.00*
No. 2 heavy melting	*31.50-32.50*
No. 1 bundles	*37.00*
No. 2 bundles	*27.00*
No. 1 busheling	*37.00*
Electric furnace bundles	37.00
Mixed borings, turnings	22.50
Short shovel turnings	24.00
Machine shop turnings	22.00
Heavy turnings	*31.00*
Structurals & plate	40.00-41.00
Couplers, springs, wheels	46.00
Rail crops, 2 ft & under	62.00-64.00

Cast Iron Grades

No. 1 cupola	38.00
Heavy breakable cast	37.00
Malleable	56.00
Drop broken machinery	49.00-50.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	33.50
No. 2 heavy melting	29.00-30.00
No. 1 bundles	33.50
No. 2 bundles	21.00-22.00
Machine shop turnings	11.00-12.00
Mixed borings, turnings	12.00-13.00
Short shovel turnings	14.00-15.00
Low phos. (structurals & plate)	45.00-46.00

Cast Iron Grades

No. 1 cupola	34.00-35.00
Unstripped motor blocks	32.00
Heavy breakable	33.00-34.00

Stainless Steel

18-8 sheets, clips, solids	*155.00-160.00*
18-8 borings, turnings	55.00-60.00
410 sheets, clips solids	60.00-65.00
430 sheets, clips, solids	75.00-80.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	23.00-24.00
No. 2 heavy melting	20.00-21.00
No. 1 bundles	23.00-24.00
No. 2 bundles	15.00-16.00
No. 1 busheling	22.00-23.00
Machine shop turnings	9.50-10.00
Mixed borings, turnings	10.50-11.00
Short shovel turnings	11.00-11.50
No. 1 cast	33.00-34.00
Mixed cupola cast	28.00-29.00
No. 1 machinery cast	35.00-36.00

BUFFALO

No. 1 heavy melting	31.00-32.00
No. 2 heavy melting	28.00-29.00
No. 1 bundles	31.00-32.00
No. 2 bundles	27.00-28.00
No. 1 busheling	31.00-32.00
Mixed borings, turnings	17.00-18.00
Machine shop turnings	16.00-17.00
Short shovel turnings	19.00-20.00
Cast iron borings	17.00-18.00
Low phos.	36.00-37.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	36.00-37.00
No. 1 machinery	41.00-42.00

Railroad Scrap

Rails, random lengths	43.00-44.00
Rails, 3 ft and under	50.00-51.00
Railroad specialties	36.00-37.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	29.00-30.00
No. 2 heavy melting	24.00-25.00
No. 1 bundles	29.00-30.00
No. 2 bundles	20.00-21.00
No. 1 busheling	29.00-30.00
Machine shop turnings	14.00-15.00
Mixed borings, turnings	17.00-18.00
Short shovel turnings	17.00-18.00
Cast iron borings	17.00-18.00
Low phos., 18 in.	36.00-37.00

Cast Iron Grades

No. 1 cupola	35.00-36.00
Heavy breakable cast	32.00-33.00
Charging box cast	32.00-33.00
Drop broken machinery	47.00-48.00

Railroad Scrap

No. 1 R.R. heavy melt	33.00-34.00
Rails, 18 in. and under	*52.00-53.00*
Rails, random lengths	*42.00-43.00*

BIRMINGHAM

No. 1 heavy melting	29.00-30.00
No. 2 heavy melting	24.00-25.00
No. 1 bundles	31.00-32.00
No. 2 bundles	16.00-17.00
No. 1 busheling	31.00-32.00
Cast iron borings	*12.00-13.00*
Short shovel turnings	21.00-22.00
Machine shop turnings	20.00-21.00
Bar crops and plates	38.00-39.00
Structurals & plate	38.00-39.00
Electric furnace bundles	35.00-36.00
Electric furnace:	
3 ft and under	33.00-34.00
2 ft and under	34.00-35.00

Cast Iron Grades

No. 1 cupola	*48.00-49.00*
Stove plate	47.00-48.00
Unstripped motor blocks	*38.00-39.00*
Charging box cast	22.00-23.00
No. 1 wheels	37.00-38.00

Railroad Scrap

No. 1 R.R. heavy melt.	34.00-35.00
Rails, 18 in. and under	*48.00-49.00*
Rails, rerolling	47.00-48.00
Rails, random lengths	*41.00-42.00*
Angles, splice bars	40.00-41.00

SEATTLE

No. 1 heavy melting	34.00†
No. 2 heavy melting	32.00†
No. 1 bundles	33.00†
No. 2 bundles	25.00†
Machine shop turnings	26.00†
Mixed borings, turnings	26.00†
Electric furnace, No. 1	46.00

Cast Iron Grades

No. 1 cupola	35.00†
Heavy breakable cast	32.00†
Unstripped motor blocks	27.00†
Stove plate (f.o.b. plant	25.00†

†Nominal

LOS ANGELES

No. 1 heavy melting	**39.00**
No. 2 heavy melting	**37.00**
No. 1 bundles	**38.00**
No. 2 bundles	**30.00**
Machine shop turnings	**20.00**
Shoveling turnings	**25.00**
Cast iron borings	**25.00**
Cut structurals and plate 1 ft and under	**54.00**

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	**52.00**

Railroad Scrap

No. 1 R.R. heavy melt.	**39.00**

SAN FRANCISCO

No. 1 heavy melting	**36.00**
No. 2 heavy melting	**34.00**
No. 1 bundles	**34.00**
No. 2 bundles	**26.00**
Machine shop turnings	**20.00**
Mixed borings, turnings	**20.00**
Cast iron borings	**20.00**
Heavy turnings	**20.00**
Short shovel turnings	**20.00**
Cut structurals, 3 ft	**48.00**

Cast Iron Grades

No. 1 cupola	45.00
Charging box cast	38.00
Stove plate	36.00
Heavy breakable cast	34.00
Unstripped motor blocks	34.00
Clean auto cast	45.00
No. 1 wheels	36.00
Drop broken machinery	45.00

HAMILTON, ONT.

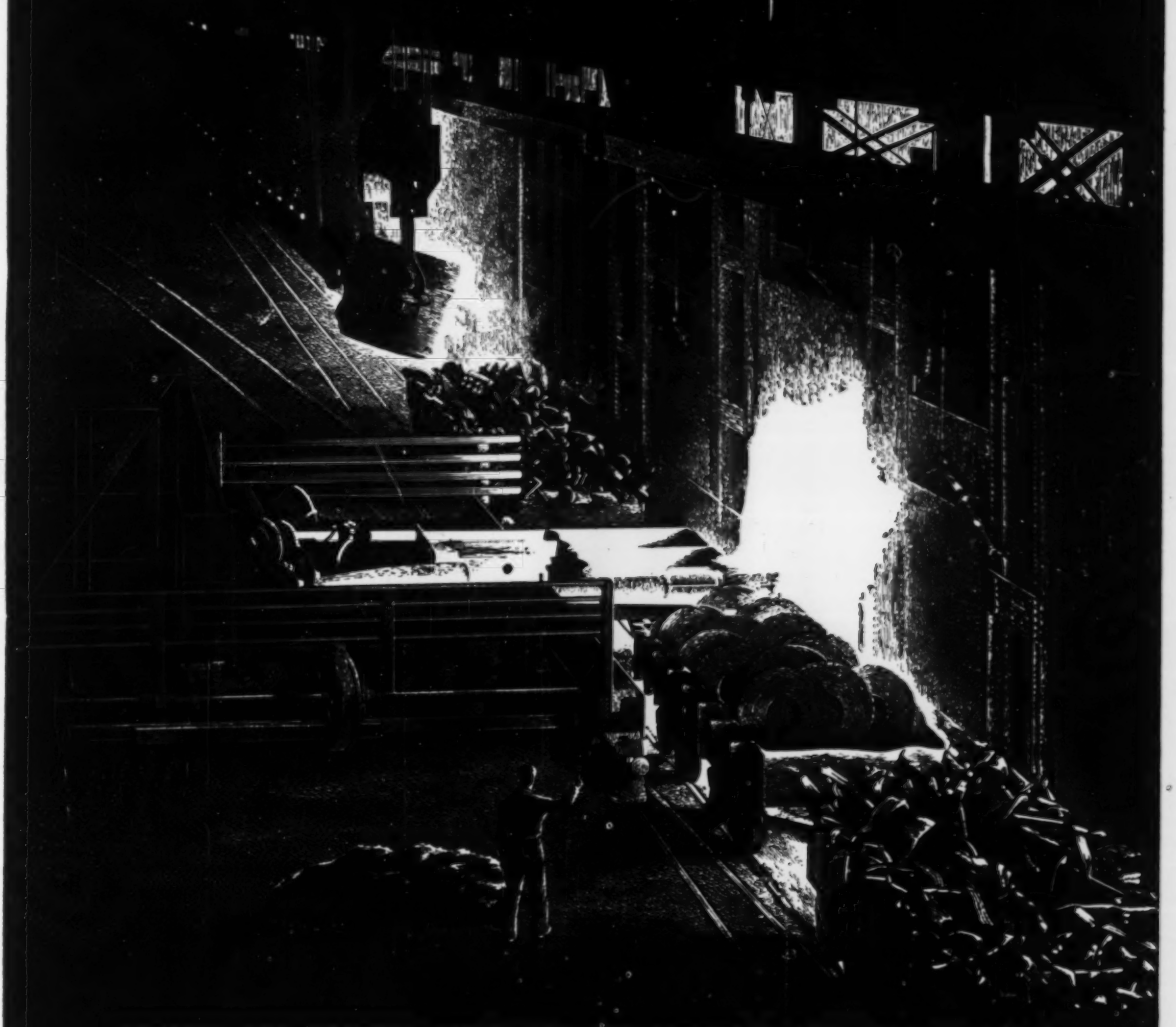
No. 1 heavy melting	34.00
No. 2 heavy melting	29.00
No. 1 bundles	34.00
No. 2 bundles	24.00
Mixed steel scrap	29.00
Mixed borings, turnings	19.00
Busheling, new factory:	
Prepared	34.00
Unprepared	28.00
Short steel turnings	23.00
Rails, rerolling	42.00

Cast Iron Grades†

No. 1 machinery cast	50.00

†F.o.b. Hamilton, Ont.

for the purchase or sale of **scrap**



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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Copper Market Strengthens

Custom smelters raise price to 25.50 cents. Kennecott to cut domestic copper output by 3800 tons monthly. Tin production curtailments now in effect

Nonferrous Metal Prices, Pages 114 & 115

COPPER may be rebounding from some of the problems that have plagued it all year.

One Symptom—Custom smelters took a look at sharp gains on the London Metal Exchange and raised their price one-half cent to 25.5 cents a pound on Dec. 16. The last change was on Nov. 21 when custom smelters cut the price one-half cent.

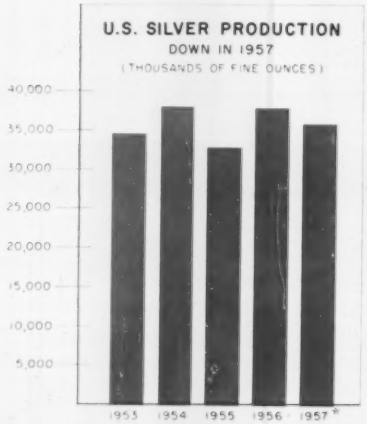
The rapid rise in London wiped out two weeks of sinking quotations that threatened further reductions in both the domestic primary and custom smelter prices. Major credit for London's recovery goes to Kennecott Copper Corp. which announced plans to reduce its U. S. production by 12 per cent (3800 tons monthly) starting in early 1958.

Metalmen have said for months that production would have to go under the knife before world prices could stabilize. The latest move by Kennecott brings announced U. S. production cutbacks to around 13,000 tons a month. Another 8500 tons a month will be siphoned off the market next year by the government, which is committed by contract to buy the output of several small mines. But new U. S. production coming in during 1958 may offset some of these gains.

Overseas—Foreign production is the highest in history this year. But there are some signs the situation may ease in 1958. Earlier this year the Rhodesian Selection Trust announced a 10 per cent production cutback. Katanga is rumored to be considering a 10 per cent slash. Chile still blows hot and cold on any curtailment, but observers say moves by the big European producers would force Chile into step.

Gains—Copper statistics for November show some improvement over October, even though production remained at high levels. World deliveries to fabricators registered 255,495 tons, the best month since May.

Domestic primary and refined production also saw only slight declines in November, registering 89,253 tons and 128,371 tons—compared with 93,078 tons and 129,832 tons in October. But deliveries in the U. S. fell to 106,815 tons from the October figure of 114,203 tons. Refined stocks dropped over 5000 tons to the 161,522-ton mark.



Source: American Bureau of Metal Statistics
*STEEL estimate

Lead, Zinc—Both metals have strengthened recently on the LME. Partial credit can be given to domestic producers who didn't allow a falling foreign price pattern to affect domestic quotations and so encouraged London to move back up. The U. S. industry evidently felt a decline here would only have stimulated the LME decline.

Tin Curtailment on

The International Tin Council's three-month curtailment of world production went into effect on Dec. 15. It means a production drop of about 10,000 gross tons during 1958's first quarter.

Major reason for the cutback is that ITC's buffer stock will hit 11,000 to 14,000 gross tons this year, about double estimates. Two reasons: 1. Russia sold 6600 gross tons of tin in Western Europe during the first ten months of 1957 under the London price. 2. Demand in general is off.

Domestic consumers bought heavily in the first five months but have held back since then. Result: Demand has dipped sharply. In the fourth quarter, it may be off as much as 25 per cent from the 5500-ton monthly average of 1956's fourth quarter.

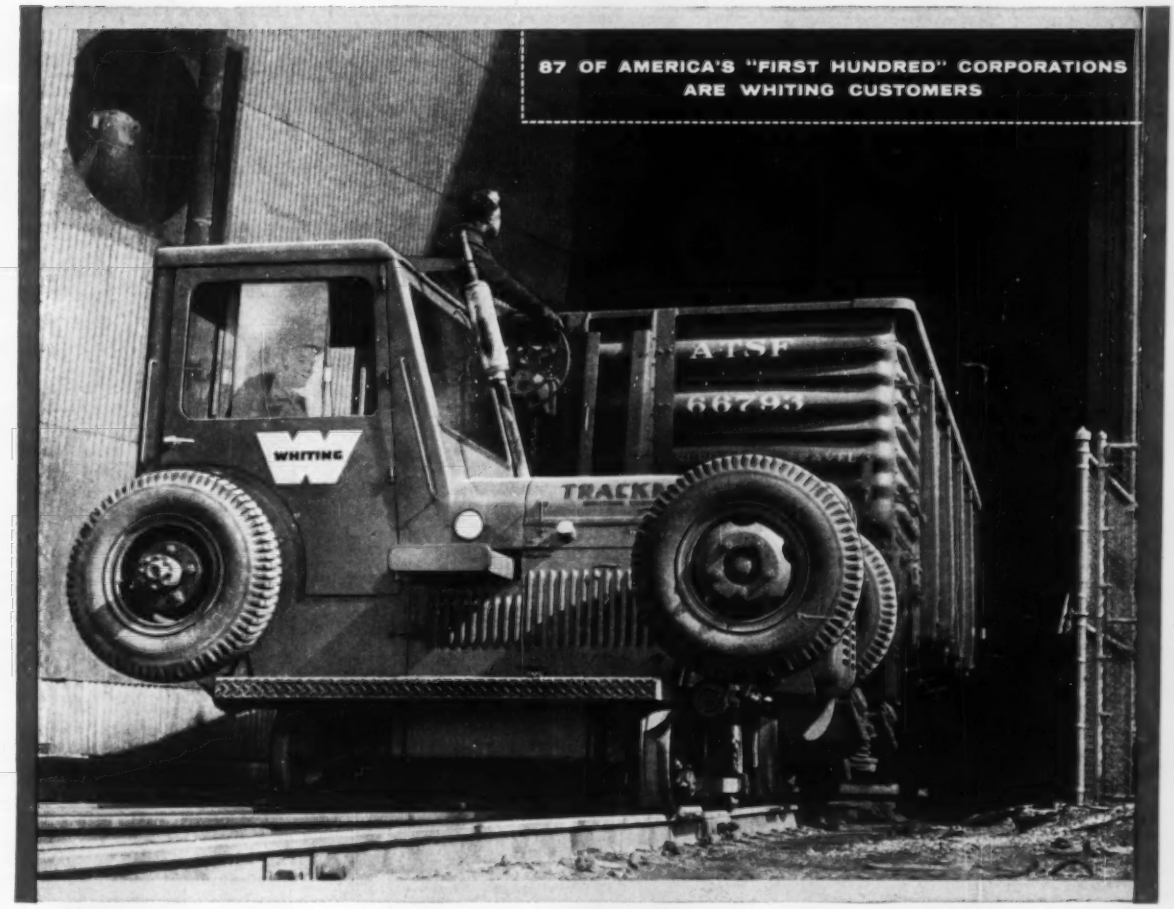
Industry people say U. S. consumption will probably be down 5 per cent this year from 1956. They estimate world consumption at around 150,000 gross tons, compared with 156,000 gross tons in 1956. World production will probably see a slight drop of around 10,000 gross tons.

The production curtailment won't affect U. S. buyers if demand stays where it is. But a sharp demand upswing could find tin in temporary short supply.

NONFERROUS PRICE RECORD

	Price Dec. 18	Last Change	Previous Price	Nov. Avg	Oct. Avg	Dec., 1956 Avg
Aluminum ..	26.00	Aug. 1, 1957	25.00	26.000	26.000	25.000
Copper	25.50-27.00	Dec. 16, 1957	25.00-27.00	26.217	26.361	35.650
Lead	12.80	Dec. 2, 1957	13.30	13.300	13.504	15.800
Magnesium .	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	64.500
Tin	92.75	Dec. 18, 1957	93.00	89.288	91.843	105.067
Zinc	10.00	July 1, 1957	10.50	10.000	10.000	13.500

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. shipping point; MAGNESIUM, pig, 99.8%, Velasco, Tex.



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WHITING

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Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 26.00; ingots, 28.10, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 29.90; No. 43, 29.70; No. 195, 31.30; No. 241, 31.50; No. 356, 29.90, 30-lb ingots.

Antimony: R.M.M. brand, 99.5%, 33.00; Lone Star brand, 33.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 25.50-26.50, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per ton, ton lots.

Cadmium: Sticks and bars, $1.70 per lb deld.

Cobalt: 97-99%, $2.00 per lb for 550-lb keg; $2.02 per lb for 100 lb case; $2.07 per lb under 100 lb.

Columbium: Powder, $120 per lb, nom.

Copper: Electrolytic, 27.00 deld.; custom smelters, 25.50; lake, 27.00 deld.; fire refined, 26.75 deld.

Germanium: First reduction, $179.17-197.31 per lb; intrinsic grade, $197.31-220 per lb, depending on quantity.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $80-110 nom. per troy oz.

Lead: Common, 12.80; chemical, 12.90; corroding, 12.90, St. Louis. New York basis, add 0.20.

Lithium: 98 + %, 50-100 lb, cups or ingots, $12; rod, $15; shot or wire, $16. 100-500 lb, cups or ingots, $10.50; rod, $14; shot or wire, $15, f.o.b. Minneapolis.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $223-230 per 76-lb flask.

Molybdenum: Unalloyed, turned extrusions, 3.75-5.75 in. round, $9.60 per lb in lots of 2500 lb or more, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter, 71.25 per lb of nickel content before 1 cent freight allowance, f.o.b. Copper Cliff, Ont.

Osmium: $80-100 per troy oz nom.

Palladium: $21-24 per troy oz.

Platinum: $77-80 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $118-125 per troy oz.

Ruthenium: $45-55 per troy oz.

Selenium: $7.50 per lb, commercial grade.

Silver: Open market, 89.625 per troy oz.

Sodium: 16.50, c.l.; 17.00 l.c.l.

Tantalum: Rod, $60 per lb; sheet, $55 per lb.

Tellurium: $1.65-1.85 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot and prompt, 92.75.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max.), $2.25; grade A-2 (0.5% Fe max.), $2.00 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $3.50 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99+% hydrogen reduced, $4.10-4.20.

Zinc: Prime Western, 10.00; brass special, 10.25; intermediate, 10.50, East St. Louis, freight allowed over 0.50 per lb, New York basis, add 0.50. High grade, 11.35; special high grade, 11.75 deld. Die casting alloy ingot No. 3, 14.25; No. 2, 15.25; No. 5, 14.75 deld.

Zirconium: Sponge, commercial grade, $5.10 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 24.00-25.50; No. 12 foundry alloy (No. 2 grade), 22.00-23.25; 5% silicon alloy, 0.60 Cu max., 25.75-26.25; 13 alloy, 0.60 Cu max., 25.75-26.25; 195 alloy, 25.00-27.00; 108 alloy, 22.50-23.25. Steel deoxidizing grades, notch bars, granulated or shot; Grade 1, 24.00; grade 2, 22.25; grade 3, 21.00; grade 4, 19.00.

Brass Ingot: Red brass, No. 115, 27.25; tin bronze, No. 225, 36.00; No. 245, 30.75; high-leaded tin bronze, No. 305, 31.25; No. 1 yellow, No. 405, 22.75; manganese bronze, No. 421, 24.50.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.82, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.80, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 30,000-lb lots, 32.355; l.c.l., 32.98. Weatherproof, 30,000-lb lots, 33.66; l.c.l., 34.78. Magnet wire deld., 40.43, before quantity discounts.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $18.50 per cwt; pipe, full coils, $18.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets and strip, $9.50-15.95; sheared mill plate, $8.00-11.50; wire, $7.50-11.50; forging billets, $6.00-7.60; hot-rolled and forged bars, $6.15-7.90.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 24.00; ribbon zinc in coils, 20.50; plates 19.00

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.00-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strips, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100 and 3003 mill finish (30,000 lb base; freight allowed).

Thickness Range Inches	Flat Sheet	Coiled Sheet
0.249-0.136	43.10-47.60	.....
0.135-0.096	43.60-48.70	40.50-41.10
0.095-0.077	44.30-50.50	40.60-41.30
0.076-0.061	44.90-52.80	40.80-42.00
0.060-0.048	45.60-55.10	41.40-43.10
0.047-0.038	46.20-57.90	41.90-44.50
0.037-0.030	46.60-62.90	42.30-46.30
0.029-0.024	47.20-54.70	42.60-47.00
0.023-0.019	48.20-58.10	43.70-45.40
0.018-0.017	49.00-55.40	44.30-46.00
0.016-0.015	49.90-56.30	45.10-46.80
0.014	50.90	46.10-47.80
0.013-0.012	52.10	46.80
0.011	53.10	48.00
0.010-0.0095	54.60	49.40
0.009-0.0085	55.90	50.90
0.008-0.0075	57.50	52.10
0.007	59.00	53.60
0.006	60.60	55.00

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.70	47.50
5050-F	43.80	48.60
3004-F	44.80	50.50
5052-F	44.40	51.20
6061-T6	46.90	53.00
2024-T4	50.60	57.40
7075-T6*	58.40	66.00

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30,000 lb base.

Diam.(in.)or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	78.20	75.20	....	....
0.156-0.172	66.20	63.40	....	....
0.188	66.20	63.40	....	81.60
0.219-0.234	63.00	61.50	....	....
0.250-0.281	63.00	61.50	....	77.90
0.313	63.00	61.50	....	74.20
0.344	62.50	....	....	....
Cold-Finished				
0.375-0.547	62.50	61.30	74.80	69.80
0.563-0.688	62.50	61.30	71.10	65.50
0.719-1.000	61.00	59.70	64.90	61.70
1.063	61.00	59.70	....	59.60
1.125-1.500	58.60	57.40	62.80	59.60
Rolled				
1.563	57.00	55.70	....	....
1.625-2.000	56.30	54.90	....	57.50
2.125-2.500	54.80	53.40	....	....
2.563-3.375	53.20	51.70	....	....

Forging Stock: Round, Class 1, 45.20-58.60 in specific lengths, 36-144 in., diam. 0.375-8 in. Rectangles and squares, Class 1, 50.50-66.60 in random lengths, 0.375-4 in. thick, width 0.750-10 in.

Pipe: ASA schedule 40, alloy 6063-T6, standard lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
¾	$19.40	2	$ 59.90
1	30.50	4	165.05
1¼	41.30	6	296.10
1½	49.40	8	445.55

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	45.40-47.00	60.60-64.80
12-14	45.70-47.20	61.30-65.80
15-17	45.90-47.90	62.50-67.50
18-20	46.50-48.30	64.50-70.10

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grade, .032 in., 171.30; .081 in., 108.70; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.70; .25-.75 in., 70.60-71.60. Tooling plate, .25-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots.)

Aluminum: 1100 clippings, 13.50-14.00; old sheets, 10.50-11.00; borings and turnings, 6.50-

BRASS MILL PRICES

MILL PRODUCTS a

	Sheet, Strip, Plate	Rod	Wire	Seamless Tubes
Copper	50.13b	47.36c	....	50.32
Yellow Brass	44.02	32.30d	44.56	46.93
Low Brass, 80%	46.50	46.44	47.04	49.31
Red Brass, 85%	47.37	47.31	47.91	50.18
Com. Bronze, 90%	48.78	48.72	49.32	51.34
Manganese Bronze	52.01	46.01	56.61	....
Muntz Metal	46.39	42.20	....	....
Naval Brass	48.27	42.58	55.33	51.68
Silicon Bronze	54.76	53.95	54.80	56.74e
Nickel Silver, 10%	60.43	62.75	62.75	....
Phos. Bronze, A-5%	69.07	69.57	69.57	70.75

SCRAP ALLOWANCES f

	Clean Heavy	Rod Ends	Clean Turnings
Copper	23.000	23.000	22.250
Yellow Brass	17.375	17.125	15.750
Low Brass, 80%	19.500	19.250	18.750
Red Brass, 85%	20.250	20.000	19.500
Com. Bronze, 90%	21.000	20.750	20.000
Manganese Bronze	16.125	15.875	15.375
Muntz Metal	16.375	16.125	15.625
Naval Brass	16.125	15.875	15.375
Silicon Bronze	22.625	22.375	21.625
Nickel Silver, 10%	23.625	23.375	11.813
Phos. Bronze, A-5%	23.750	23.500	22.500

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold--drawn. d. Free cutting. e. 3% silicon. f. prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, or any or all kinds of scrap, add 1 cent per lb.

7.00; crankcases, 10.50-11.00; industrial castings, 10.50-11.00.

Copper and Brass: No. 1 heavy copper and wire, 18.50-19.00; No. 2 heavy copper and wire, 16.50-17.00; light copper, 14.50-15.00; No. 1 composition red brass, 15.50-16.00; No. 1 composition turnings, 15.00-15.50; new brass clippings, 13.00-13.50; light brass, 9.50-10.00; heavy yellow brass, 11.50-12.00; new brass rod ends, 12.00-12.50; auto radiators, unsweated, 12.00-12.50; cocks and faucets, 12.50-13.00; brass pipe, 12.50-13.00.

Lead: Heavy, 8.50-8.75; battery plates, 3.50-3.75; linotype and stereotype, 10.25-10.75; electrotype, 9.25-9.75; mixed babbitt, 10.50-11.00.

Monel: Clippings, 28.00-29.00; old sheets, 25.00-26.00; turnings, 20.00-23.00; rods 28.00-29.00.

Nickel: Sheets and clips, 42.00-45.00; rolled anodes, 42.00-45.00; turnings, 37.00-40.00; rod ends, 42.00-45.00.

Zinc: Old zinc, 3.00-3.25; new diecast scrap, 2.75-3.00; old diecast scrap, 1.50-1.75.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings, 16.50-17.50; 3003 clippings, 16.50-17.50; 6151 clippings, 16.00-17.50; 5052 clippings, 16.00-17.00; 2014 clippings, 15.50-17.00; 2017 clippings, 15.50-17.00; 2024 clippings, 15.50-17.00; mixed clippings, 15.00-16.00; old sheets, 13.50; old cast, 13.50; clean old cable (free of steel), 16.00-16.50; borings and turnings, 13.50-15.00.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 53.00; light scrap, 48.00; turnings and borings, 33.00.

Copper and Brass: No. 1 heavy copper and wire, 21.25; No. 2 heavy copper and wire, 19.25; light copper, 17.00; refinery brass (60% copper) per dry copper content, 19.00.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper and Brass: No. 1 heavy copper and wire, 21.25; No. 2 heavy copper and wire, 19.25; light copper, 17.00; No. 1 composition borings, 18.50; No. 1 composition solids, 19.00; heavy yellow brass solids, 13.00; yellow brass turnings, 12.00; radiators, 15.00.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.70 per lb.

Copper: Flat-rolled, 43.79; oval, 42.00, 5000-10,000 lb; electrodeposited, 35.75, 2000-5000 lb lots; cast, 36.25, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; 10-499 lb, 112.00; 500-4999 lb, 107.50; 5000-29,999 lb, 105.25; 30,000 lb, 103.00. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 111.50; 200-499 lb, 110.00; 500-999 lb, 109.50; 1000 lb or more, 109.00.

Zinc: Balls, 17.50; flat tops, 17.50; flats, 19.25; ovals, 18.50, ton lots.

CHEMICALS

Cadmium Oxide: $1.70 per lb in 100-lb drums.

Chromic Acid: 100 lb, 33.30; 500 lb, 32.80; 2000 lb 32.15; 5000 lb, 31.80; 10,000 lb, 31.30; f.o.b. Detroit.

Copper Cyanide: 100-200 lb, 71.60; 300-900 lb, 69.60.

Copper Sulphate: 100-1900 lb, 14.55; 2000-5900 lb, 12.55; 6000-11,900 lb, 12.30; 12,000-22,900 lb, 12.05; 23,000 lb or more, 11.55.

Nickel Chloride: Less than 400 lb, 35.00; 400-9999 lb, 33.00; 10,000 lb, 32.50.

Nickel Sulphate: 5000-22,000 lb, 33.50; 23,000-35,900 lb, 33.00; 36,000 lb or more, 32.50.

Sodium Cyanide: 100 lb, 27.60; 200 lb, 25.90; 400 lb, 22.90; 1000 lb, 21.90; f.o.b. Detroit.

Sodium Stannate: Less than 100 lb, 74.70; 100-600 lb, 65.80; 700-1900 lb, 63.00; 200-9900 lb, 61.20; 10,000 lb or more, 59.80.

Stannous Chloride (anhydrous): Less than 25 lb, 164.10; 25 lb, 129.10; 100 lb, 114.10; 400 lb, 111.60; 5200-19,600 lb, 99.40; 20,000 lb or more, 87.20.

Stannous Sulphate: Less than 50 lb, 126.90; 50 lb, 96.90; 100-1900 lb, 94.90; 2000 lb or more, 92.90.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

(*Concluded from Page* 109)

Youngstown—The scrap market here is dull, with no improvement in sight. Steel ingot operations are down to 63 per cent; a further decline is indicated for Christmas week. A little No. 1 heavy melting industrial scrap moved to a couple district steel mills recently, but dealer scrap continues inactive.

Detroit—No scrap purchases were noted here last week, and prices remain unchanged. Local dealers and brokers are gloomy about prospects. They expect prices to slide again when auto lists come out. Preliminary reports on the Chrysler list indicate tonnages are substantially off for the end of December. It's expected that other lists will also be down.

Buffalo—Scrap prices are expected to drop sharply early next year unless the mills begin buying soon. Prices are nominal because of the absence of sales. The mills are using a high ratio of hot metal in their open hearth melts. And they are getting a good flow of prime auto plant scrap on a reciprocal basis, cutting down their requirements of dealer material.

District foundries are operating on reduced schedules. They need little additional cast scrap. Electric furnaces have also cut back on their scrap purchases.

St. Louis—Major consumers last week were completely out of the scrap market for No. 1 grades. Prices held unchanged, but they were nominal. No major sales, or price changes, are anticipated until after the turn of the year.

Birmingham — Scrap continues inactive. Most steel mills and foundries indicate they will be out

CLASSIFIED

Help Wanted

CLEANING ROOM SUPERINTENDENT: Must have supervisory experience and be completely familiar with all phases of cleaning room operations for a miscellaneous steel jobbing foundry producing castings up to 10,000 pounds. Excellent opportunity for an aggressive qualified man wth a modern and progressive foundry located in the Middle West producing 600-700 tons per month. Advise full particulars including salary requirements, Box 603, STEEL, Penton Bldg., Cleveland 13, Ohio.

ENGINEER CAPABLE OF DESIGNING, stressing and drafting steel mill auxiliary equipment and devices. Should be able to start from original ideas and carry through to final installation, put them in production and train labor force. Three to five years experience in steel mills and workshop experience necessary. Write Box No. 627, STEEL, Penton Bldg., Cleveland 13, Ohio.

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CHAMBERSBURG, PA.

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4½" Diameter x .060 to .125
6½" to 10" Diameter x .060 to .125
11" to 12½" Diameter x .085 to .095
Hot or Cold Rolled

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Phone Slatington, Pa. POrter 7-3821

STEEL PLANT ENGINEER

A graduate Mechanical Engineer is needed to fill a permanent position in our Plant Engineering Department at Fontana.

This opportunity is available for an outstanding engineer whose experience includes the design, maintenance, construction and layout of rolling mills and steel making facilities.

If your qualifications meet these requirements, send complete resume with salary requirements to

Employment Manager

KAISER STEEL CORP.

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To represent Spring Company, specializing in miniature springs, wire forms, and stampings on a 5 to 10% commission basis. Areas preferred New Jersey, Upper New York State or Philadelphia. Please write:

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of the market the remainder of this year. Some foundries made limited purchases of No. 1 cast at $1 a ton over recent prices. Brokers predict little activity until the turn of the year.

Seattle—The scrap market continues to be inactive. Receipts are off, reflecting slow demand and unattractive prices. The mills are are out of the market. They have comfortable inventories. Prices are nominal.

The export trade is equally inactive. Exporters do not expect Japan to resume purchasing until March. Full cargo charters are announced at $65,000 to $73,500 per vessel, North Pacific loading to Japan. The figures compare with a high of $203,500, North Pacific loading, a year ago.

San Francisco — No change in steel scrap prices is expected the remainder of this month. Sluggish market conditions are continuing.

Los Angles—The market undertone continues soft; little improvement is in sight. Lack of export demand to cushion slack domestic buying is expected to push prices lower.

Iron Ore . . .

Iron Ore Prices, Page 106

Reflecting declining consumption, Cleveland-Cliffs Iron Co. curtailed its iron ore mining operations in Michigan. It reduced its mine work force (about 175) close to 5½ per cent—in addition to seasonal layoffs. About a month ago, the company started a four-day week at some of its Ishpeming and Negaunee properties.

Pig Iron . . .

Pig Iron Prices, Page 105

Inquiry for merchant pig iron is at about the lowest level of the year. This is due to yearend inventory policies of consumers and to the fact that demand for castings is slow. Only a few foundries are working more than four days a week.

The outlook for merchant iron business in the first quarter is uncertain. Some market observers see little prospect of any substantial pickup for several months.

The widespread movement to curtail blast furnace operations

continues. But Sharon Steel Corp., Sharon, Pa., has relighted one of its two blast furnaces at its Roemer Works, Farrell, Pa. The furnace was shut down a month ago for repairs. The company's other furnace at Farrell, and one at its Lowellville (Pa.) Works are still idle. Sharon Steel is operating six open hearths out of 12 at Farrell and three out of five at Lowellville, and its two electric arc furnaces at Lowellville.

Structural Shapes . . .

Structural Shape Prices, Page 98

Structural fabricating shops are working off backlogs which still run five to six months in most cases. New contracts are under price pressure in the East, and lower volume is more widely distributed, including small and medium-size bridges.

Building contractors are shopping around for lowest prices, with deliveries improving. A group of small fabricating shops is involved in price competition, accounting for the wider distribution of contracts.

Generally, structurals are in balance with demand, and yearend carryovers will be nil at structural mills. Less work is being estimated at the engineering-planning level, which is usually four to six months ahead of the structural shops.

Heavy wide-flange beams are the only product which Pittsburgh area fabricators can't always obtain in desired quantities. New orders for light structurals in that area are slipping.

Warehouse . . .

Warehouse Prices, Page 105

All warehouse steel products are included in a general sales slowdown. Consumers are buying only tonnages needed for current needs and are requesting prompt shipment. There is no indication that volume of bookings will be larger next month.

Mills are offering distributors extra tonnages of structural shapes, eliminating one of the last shortages of products. In a few districts, the supply of heavy plates is tight, but most distributors have a well balanced inventory of all items.

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Hyde Park

RED CIRCLE Rolls ALLOY-CHILLED

Rolling Mill Equipment

Outstanding in quality and in performance Hyde Park Rolling Mill Equipment has enjoyed the respect of the industry for more than fifty years.

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Hyde Park

FOUNDRY & MACHINE CO.
Hyde Park, Westmoreland County, Pa.

ROLLS
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GREY IRON CASTINGS

Tool Steel Topics

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

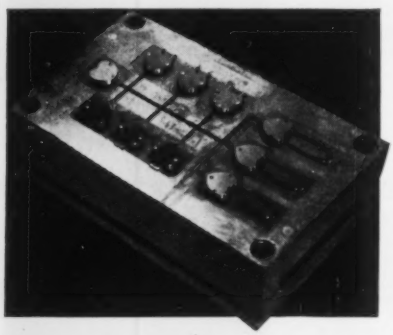
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Distributor: Bethlehem Steel Export Corporation

Lustre-Die Takes High Polish For Molding Plastic Rattles

Shreve Molded Products, Youngstown, Ohio, needed an injection mold for the production of heart-shaped parts for baby rattles, using acetate and styrene plastics. They wanted a mold capable of taking a high polish, so as to produce unusually attractive parts. In addition, the mold had to have the stamina to perform economically during long production runs.

The problem was put up to Leed Steel Co., Buffalo, N. Y., Bethlehem's local tool steel distributor. Their recommendation was Lustre-Die tool steel. It proved to be an excellent choice, too, for the mold, which was produced by Tri-Penn Tool Co., Erie, Pa., has been satisfactory in every way.



Lustre-Die is ideal tool steel for producing plastic parts because its properties enable it to take an unbelievably bright, mirror-like polish. Not only does Lustre-Die have the proper basic analysis for working with plastics—we even go a step beyond that by adding alloy fortification. We also build up the steel's excellent properties by oil-quenching and tempering, so that it can be furnished ready for machining and polishing.

Lustre-Die is made in the electric furnace, and is carefully inspected to insure cleanliness. It has a minimum of inclusion-causing additions. Besides, modern inspection methods hold injurious porosity to the minimum.

If you have any questions about Lustre-Die, or if you would like to give it a trial run, your Bethlehem tool steel distributor will be pleased to assist you.

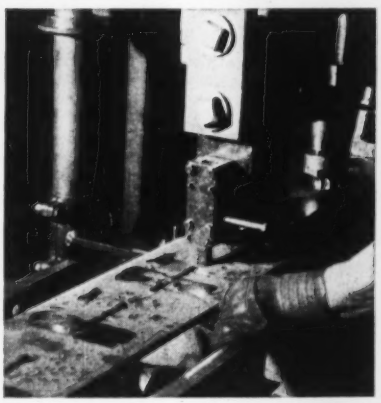
BETHLEHEM TOOL STEEL ENGINEER SAYS:

It Pays to Keep Tools Sharp

In many shops, resharpening of production cutting tools is sadly neglected. In an effort to keep output high, too many tools are kept in use beyond the point where the cutting edges become excessively dull.

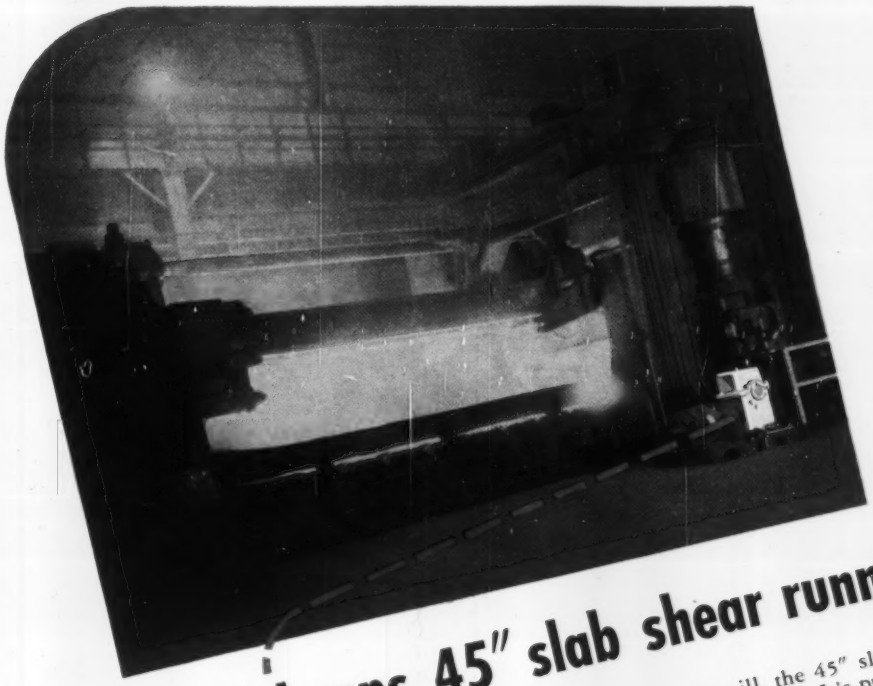
What happens when edges are dull? The dull edges cause an increase in the service load of the shearing or cutting operation. If the dullness is carried to extremes, tools break. Dull edges also produce rough surfaces on the parts, which may lead to rejections due to defects, or because the permissible tolerances have been exceeded.

Should resharpening be delayed too long, it may be impossible to recondition a tool properly, as deep spalls, cracks and gouges cannot be removed. Usually there is an economic balance point where it is best to resharpen, and for each operation this should be determined in advance. Tools should also be inspected regularly, to prevent excessive dulling. Intelligent use of preventive maintenance of cutting edges can work wonders in providing longer tool life and fewer broken tools.



Bearcat Puts Square Holes in ½-in. Plate

In this operation, photographed at Frink Sno-Plows, Inc., Clayton, N. Y., Bethlehem Bearcat is putting 11/16-in. square holes in carbon-steel plate, used as cutting edge of snow plows. Though the steel plate is 1/2 in. thick, the average life of each punch is 5500 holes.



• Cleveland worm gear speed reducer installed on a Mesta 45" slab shear in a large eastern steel company plant.

CLEVELAND keeps 45" slab shear running steadily

TO keep up with the speed of the mill, the 45" slab shear pictured must cut rapidly and steadily. It's punishing work—calls for a thoroughly dependable drive for the shear. With a Cleveland worm gear drive handling the job, shearing keeps pace—operations run on schedule.

Cleveland worm gear speed reducers are used on all kinds of tough jobs, wherever dependable power transmission is vital. Easy to see why, too. Compact and space-saving, Clevelands have high shock load resistance. The case-hardened steel worm and long wearing nickel-bronze gear actually improve with use. Even operating under continued, severe overloads, danger of sudden failure is remote. Torque flow is smooth and uninterrupted. Gearing is enclosed in an oil bath, assuring positive lubrication, safety for operators, minimum maintenance.

Thousands of Clevelands are on the job after years of hard work, as efficient as the day they started. Get the full story. See how they can help improve *your* operations and profits. Write for Catalog 400. The Cleveland Worm & Gear Company, 3270 East 80th St., Cleveland 4, Ohio.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.

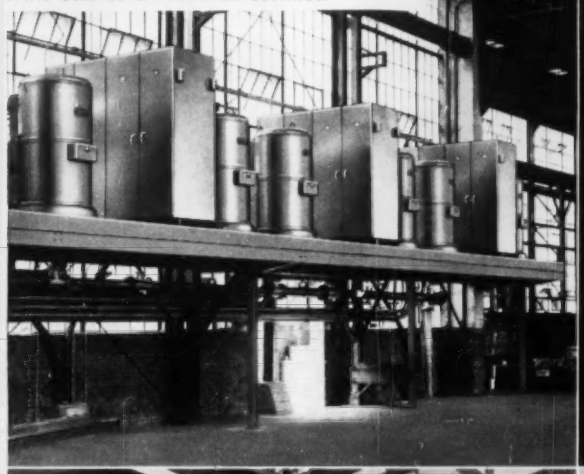
CLEVELAND
Worm Gear
Speed Reducers

Choice of the Leaders

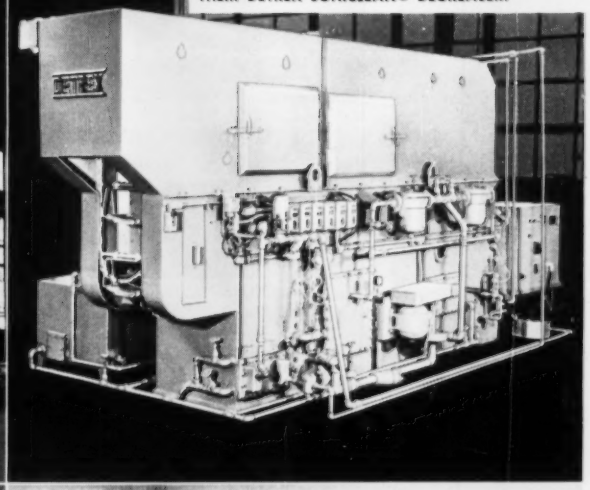
CUTLER-HAMMER
☆ ☆ ☆
MOTOR CONTROL
C-H

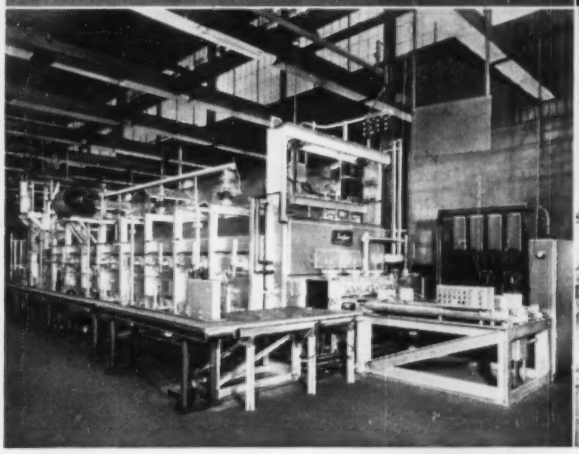
The Mark of Better Machines

EACH OF THESE 300 KW GENERATORS BUILT BY THE TOCCO DIVISION OF THE OHIO CRANKSHAFT COMPANY USES CUTLER-HAMMER CONTROL.

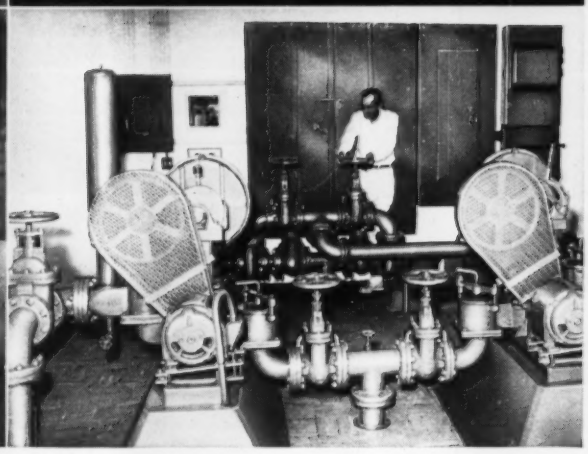


DETREX CHEMICAL INDUSTRIES, INC. INSTALLS CUTLER-HAMMER THREE-STAR MOTOR CONTROL ON THEIR DETREX SONICLEAN® DEGREASER.





THE FULLY AUTOMATIC PUSHER TYPE CARBURIZING HEAT TREATMENT FURNACE MANUFACTURED BY THE SPECIAL FURNACE DIVISION OF THE SURFACE COMBUSTION CORP. IS EQUIPPED WITH CUTLER-HAMMER THREE-STAR MOTOR CONTROL AND HEAVY DUTY OIL-TIGHT PUSHBUTTONS.



YEOMANS BROTHERS COMPANY SELECTED CUTLER-HAMMER MOTOR CONTROL AND HEAVY DUTY PUSHBUTTONS FOR THEIR PUMPS AND OTHER WASTE TREATMENT EQUIPMENT.

The Stars Never Stand Still

Commercial leadership is never self-appointed. It is awarded to a manufacturer when the majority of the market repeatedly specifies and purchases his products. But the laurels of yesterday are quickly lost unless they are rewon again and again. The leading machinery builders know this and they protect their coveted position with a comprehensive product improvement program . . . new materials, new designs, new components. *The stars never stand still.* It is very significant that so many of the leading machinery builders now standardize on Cutler-Hammer Three-Star Motor Control as original equipment for their machines. Such acceptance is the result of direct competitive comparison that proved a definite superiority. It follows that machinery buyers find Cutler-Hammer Motor Control a reliable guide in selecting machines of greater value and satisfaction. CUTLER-HAMMER, Inc., 1211 St. Paul Avenue, Milwaukee 1, Wisconsin. *Associate:* Canadian Cutler-Hammer, Ltd., Toronto.